ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)

TRUNK HIGHWAY (TH) 53 INTERSECTION AND PASSING LANE IMPROVEMENTS

MnDOT District 1; S.P. 6920-53

MnDOT proposes to provide safety and mobility improvements to Trunk Highway (TH) 53 intersections with TH 1 south and north of Cook, MN, and to add passing lanes at four non-contiguous locations between Cook and International Falls.

December 2018

ENVIRONMENTAL ASSESSMENT WORKSHEET

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List of Abbreviations

BMP	Best Management Practices
Co Hwy	County Highway
CR	County Road
CSAH	County State Aid Highway
dBA	Decibels A-weighted
DNR	Department of Natural Resources
BWSR	Minnesota Board of Water and Soil Resources
EA	Environmental Assessment
EAW	Environmental Assessment Worksheet
FAA	Federal Aviation Administration
LGU	Local Government Unit
MGS	Minnesota Geologic Survey
MnDNR	Minnesota Department of Natural Resources
MN	State of Minnesota
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPCA WIMN	Minnesota Pollution Control Agencies What's in My Neighborhood website
NHIS	Natural Heritage Information System
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
PWI	Public Waters Inventory
RGU	Responsible Governmental Unit
R/W	Right-of-Way
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
TH	Trunk Highway
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
WCA	Wetland Conservation Act

1 Project Title

Trunk Highway (TH) 53 Intersection and Passing Lane Improvements

2 Proposer

Organization:	Minnesota Department of Transportation
Contact person:	Duane Hill, P.E.
Title:	District Engineer
Address:	1123 Mesaba Avenue
City, State, ZIP:	Duluth, MN 55811
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3 RGU

Organization:	Minnesota Department of Transportation
Contact person:	Josie Olson, P.E.
Title:	Project Manager
Address:	1123 Mesaba Avenue
City, State, ZIP:	Duluth, MN 55811
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4 Reason for EAW Preparation

Required:

☐ EIS Scoping

☒ Mandatory EAW MS 4410-4300, Subpart 22, B

Discretionary:

☐ Citizen petition

☐ RGU discretion

☐ Proposer initiated

5 Project Location

County	South TH 53/TH 1 Intersection: St. Louis
	North TH 53/TH 1 Intersection: St. Louis
	Passing Lane (PL) 1 (RP 98 to 100.5): St. Louis
	PL2 (RP 118.5 to 121): St. Louis
	PL3 (RP 136.5 to 139): St. Louis
	PL 4 (RP 149 to 151.5): Koochiching
City/Township	South Intersection (US-53 & STH-1/CR-22): Angora Township
	North Intersection (US-53 & STH-1/Ashawa): Field Township
	PL1 (RP 98 to 100.5): Field Township
	PL2 (RP 118.5 to 121): St. Louis County (no Township jurisdiction)
	PL3 (RP 136.5 to 139): St. Louis County (no Township jurisdiction)
	PL4 (RP 149 to 151.5): Koochiching County (no Township jurisdiction)

PLS Location	Section	Township	Range
(¼, ¼, Section,			
Township, Range):			
South Intersection (US-53 & STH-1/CR-22)	8	61N	18W
	9	61N	18W
North Intersection (US-53 & STH-1/Ashawa)	11	62N	19W
	13	62N	19W
	14	62N	19W
PL1 (RP 98 to 100.5)	29	63N	19W
	30	63N	19W
	32	63N	19W
	33	63N	19W
PL2 (RP 118.5 to 121)	22	66N	20W
	26	66N	20W
	27	66N	20W
	35	66N	20W
PL3 (RP 136.5 to 139)	3	68N	21W
	4	68N	21W
	10	68N	21W
	11	68N	21W
	14	68N	21W
PL4 (RP 149 to 151.5)	22	69N	23W
	23	69N	23W
	25	69N	23W
	26	69N	23W
Watershed (82 major watershed scale):	South TH 53/TH 1 Intersection: Little Fork River		
	North TH 53/TH 1 Intersection: Little Fork River		
	PL1 (RP 98 to 100.5): Little Fork River		
	PL2 (RP 118.5 to 121): Vermilion River		
	PL3 (RP 136.5 to 139): Rainy River – Rainy Lake		
	PL4 (RP 149 to 151.5): Rainy River – Rainy Lake		
GPS Coordinates:	Using NAD 83, UTM Zones 15T and 15U (Easting, Northing) in meters:		
	South TH 53/TH 1 Intersection: 526255, 5291704 (easterly project limit);		
	525853, 5291165 (southerly project limit); 525223, 5292061 (westerly project limit);		
	525496, 5292522 (northerly project limit)		
	North TH 53/TH 1 Intersection: 521547, 5301027 (easterly project limit); 521938,		
	5300488 (southerly project limit); 520343, 5301032 (westerly project limit); 520070,		
	5301297 (northerly project limit)		
	PL1 (RP 98 to 100.5): 516884, 5304222 (southerly project limit); 514033, 5307117		
	(northerly project limit)		
	PL2 (RP 118.5 to 121): 509821, 5333250 (southerly project limit); 508403, 5336966		
	(northerly project limit)		
	PL3 (RP 136.5 to 139): 500549, 5358975 (southerly project limit); 497454, 5361358		
	(northerly project limit)		
	PL4 (RP 149 to 151.5): 482270, 5364114 (southerly project limit); 478936, 5367451		
	(northerly project limit)		
Tax Parcel Number:	All of the work in Locations 1, 3, 4, 5, and 6 will be entirely in public right-of-way, and		
	almost all of the work in Location 2 will be in public right-of-way with the exception of		
	two minor acquisition areas from willing sellers.		

6 Project Description

a. EQB Monitor Description

Provide the brief project summary to be published in the EQB Monitor, (approximately 50 words).

MnDOT proposes to provide intersection improvements at Trunk Highway (TH) 53 junctions with TH 1 south and north of Cook, MN, and to add passing lanes at four 2.5 mile segments between Cook and International Falls.

b. Complete Description

Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Project Description (Including Context/Need)

TH 53 is the primary north-south arterial roadway serving this portion of Minnesota. It directly links International Falls and points north in Canada with the Cities of Virginia, Eveleth, and Duluth. At Virginia, it links with TH 169, a major state-wide highway. It is a key recreational route for those wishing to visit Superior National Forest, Voyageurs National Park, Arrowhead State Trail, the Lake Vermillion area, and other resources in Minnesota and to the north in Canada. In addition to general and recreational travel, it is a critical trucking route which supports mining, logging, and related operations in the area. In comparison with typical trunk highways, TH 53 in the project area sees a very high percentage of trucks (approximately 12-15 percent).

The Highway 53 Long Range Improvement Task Force ("Highway 53 Task Force") has been in place since the late 1990s to promote and help guide improvements to the TH 53 corridor. It is made up of representatives of the cities of International Falls, Orr, Cook, and Virginia, as well as representatives of St. Louis County, Koochiching County, the State Patrol, and local business and residents. MnDOT routinely meets with this group to discuss highway improvement projects.

As depicted in **Figure 1**, the project has the following primary components described from south to north:

- Location 1 – Safety improvements at the south TH 53/TH 1 junction
- Location 2 – Mobility and safety improvements at the north TH 53/TH 1 junction
- Locations 3-6 – Addition of passing lanes at four locations between Cook, MN and International Falls, MN

Location 1 – South TH 53/TH 1 Intersection

Need:

This intersection is approximately 3.5 miles south of Cook, and its existing condition is depicted in **Figure 2**. The east leg of the intersection is TH 1, and the west leg is County State Aid Highway (CSAH) 22. Between the two intersections addressed with this project, the mainline highway is both TH 53 and TH 1. In 2014, TH 53 was expanded from two-lane to four-lane divided from the Rice River to the south Cook city limit, a stretch of approximately nine miles. While the TH 53/TH 1 intersection south of Cook was reconstructed consistent with applicable design standards, a high number of crashes has been observed since the reconstruction.

Crash information for the intersection area since the reconstruction is provided in **Table 1**, below.

Table 1. South TH 53/TH 1 Intersection 2015-2017 Crash Information

Total Crashes	10[1]
Observed Crash Rate[2]	2.09
Statewide Average Crash Rate[3]	0.26
Critical Crash Rate[4]	0.96
Critical Crash Index[4]	**2.18**

[1]0 fatalities, 0 incapacitating injury, 5 non-incapacitating injury, 2 possible injury, 3 property (includes vehicles) damage only.

[2] Total crashes per million vehicles entering the intersection area.

[3]For similar intersection category.

[4]See information provided in text.

It can be seen that the observed crash rate is substantially higher than the statewide average for this intersection category. However, this comparison may not be conclusive; since crashes are relatively rare events that are random unless there is an intersection characteristic causing them, traffic engineers use what is termed the critical crash rate. This is calculated with statistical methods to determine what the observed crash rate would need to be to conclude that it is statistically different than the statewide average with a high level of confidence, and therefore not due to random occurrences. The observed crash rate at this intersection for the study period is 118 percent higher than the critical crash rate (2.09 versus 0.96), leading to a critical crash index of 2.18 as shown in **Table 1**. This provides clear evidence of a safety problem at this location which warrants mitigation.

Proposed Improvements:

The proposed project is to convert this to a Restricted Crossing U-Turn (R-CUT) intersection. The proposed improvements are depicted in **Figure 3**. This design approach limits the vehicle conflict points with the most potential for serious crashes by prohibiting the following movements:

- Left turns from the minor intersection legs (in this case TH 1 and CSAH 22) onto the mainline (in this case TH 53)
- Through movements on the minor roadway across the intersection

The basic strategy with this design is to provide an intersection setting in which drivers on the minor legs who wish to turn left on the mainline roadway or cross it do not need to focus on traffic from both directions on the mainline at once. Drivers on the minor intersection legs wishing to turn left onto the mainline first turn right onto the mainline, move to a left turn/U turn lane, and complete a U turn in the

direction they wish to proceed. If they wish to proceed to the other side of the intersection on the minor roadway, they move to a right turn lane after their U turn to turn onto the minor leg in the direction they wish to proceed. R-CUT conversions are widely documented to be effective in reducing crashes, most notably serious crashes, at this category of intersection. Typical sections for the south intersection are provided in **Appendix A**.

Location 2 – North TH 53/TH 1 Intersection

Need:

This intersection is approximately one mile west-northwest of Cook. The existing condition is depicted in **Figure 4**. This intersection area can be challenging for drivers to negotiate because it has a number of irregular design characteristics which are not consistent with current standards and which are not expected conditions for drivers. There are actually two TH 53 intersections, one with TH 1 to the west, and one with CSAH 115 to the east. These two intersections are closely spaced, being offset by approximately 175 feet. Thus, drivers at one of these off-set intersections must be aware of operations at the other as they are executing their maneuvers. In addition, both off-set intersections have severe skew characteristics which limits the ability to see longer distances looking to the acute angle direction, and makes it difficult for drivers on the minor legs to quickly scan both directions for opportunities to turn onto or cross the mainline (TH 53). Another problem for drivers is the fact that County Road (CR) 937 crosses CSAH 115 only 350 feet east of the TH 53/CSAH 115 intersection and links to TH 53 to the south. This creates two additional closely spaced intersections in this overall junction area, and complicates decision-making for drivers.

Crash information for the intersection area is provided in **Table 2**, below.

Table 2. North TH 53/TH 1 Intersection 2013-2017 Crash Information

Total Crashes	4[1]
Observed Crash Rate[2]	0.59
Statewide Average Crash Rate[3]	0.25
Critical Crash Rate[4]	0.82
Critical Crash Index[4]	**0.72**

[1]0 fatalities, 0 incapacitating injury, 0 non-incapacitating injury, 0 possible injury, 4 property (includes vehicles) damage only.

[2] Total crashes per million vehicles entering the intersection area.

[3]For similar intersection category.

[4]See information provided in text.

The concept of critical crash rate was discussed under the Location 1 heading, above. Based on the most recent five years of available crash data, the observed crash rate at this intersection location is higher than the statewide average, but is lower than the applicable critical rate (critical crash index of 0.72). Even though the recent crash data do not appear to reflect a large safety problem at this intersection area, the operational and mobility challenges described above are pronounced and warrant mitigation to improve mobility conditions and reduce the potential for future serious crashes.

Proposed Improvements:

The proposed improvements are depicted in **Figure 5**. The TH 1 and CSAH 115 intersections will be moved such that they are approximately 840 feet apart, and each of the minor roadway legs will "T" into TH 53 at a 90 degree angle. This will provide substantially improved sight distances and other operational and safety benefits. Moving the intersections further apart will mean that operations on one are less likely to affect operations on the other. The existing intersection for southbound to westbound movements will no longer be needed and is proposed to be removed. Similarly, with the CR 937 "T" into the future CSAH 115 alignment, the current TH 53/CR 937 intersection will no longer be needed is proposed to be removed. Both remaining intersections will have left and right turn lanes on TH 53 to remove turning movements from higher-speed through traffic, thus enhancing safety conditions. Proposed TH 53 typical sections for the north intersection are provided in **Appendix A**.

Locations 3 – 6 (Passing Lane Segments A – D)

Need:

Given the regional importance of TH 53, maintaining good levels of mobility through the corridor is an important goal for MnDOT. As referenced previously, this corridor sees a high percentage of trucks and other slow-moving vehicles such as vehicles pulling recreational trailers. Based on these factors, there is a need to allow passenger vehicles safe opportunities to pass slow-moving vehicles in the project area. Between Cook and International Falls, there currently are two passing lane segments: a) approximately four miles south of Orr (approximately one-mile segment), and b) in the northern portion of Orr (approximately one-half mile segment). However, there is a need for additional passing opportunities.

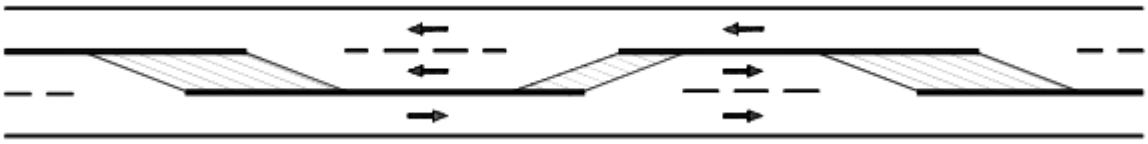
MnDOT and the Highway 53 Task Force referenced previously have evaluated and discussed this issue at length, and have established Locations 3 through 6 as the preferred sites for the passing lane additions. TH 53 has wide shoulders in the project area (10 feet, typical) which creates the opportunity for relatively low-cost, low-impact improvements which will provide passing opportunities and enhance mobility.

Proposed Improvements:

The proposed passing lane locations are depicted in **Figure 1**. The four individual passing lane sites are presented in greater detail in **Figure 6** through **Figure 9**. The existing and proposed typical section for all of the proposed passing lane segments are provided in **Appendix A**. The general approach is summarized below:

- Reconstruct existing paved shoulders to be able to carry through traffic.
- Variable depth mill and overlay to remove existing crown from middle of future center passing lane, to facilitate winter maintenance operations.
- Provide transition areas to move motorists from the current typical section at either end of each passing segment to the proposed passing lane typical section, which will include 4' paved shoulders, 12' driving lanes (one either direction), and one 12' center passing lane.
- Half of each proposed passing lane segment will be dedicated to northbound passing, and half dedicated to southbound passing, with a transition area in the middle.

A general schematic of this approach, known as the "2+1" design, is provided below. It should be noted that this is not to scale and is intended to show the general principal of the design.



Source: Application of European 2+1 Roadway Designs, National Cooperative Highway Research Program, Research Results Digest, April 2003.

Construction Methods

There are no unusual aspects of the project setting or the project design which would require unique or unproven construction methods. Therefore, construction activities and associated potential for impacts are anticipated to be typical for this type of project. The primary construction elements that could have the potential for environmental impacts are summarized under the following headings.

South TH 53/TH 1 Intersection

- Grading to prepare for new median and pavement areas
- Add median and pavement areas: center medians and turn lanes, acceleration and deceleration lanes, downstream U turn lanes, right turn lanes, etc.
- Minor drainage work
- Lighting

North TH 53/TH 1 Intersection

- Pavement removal
- Grading to prepare for new roadway and intersection areas
- Add pavement areas where needed
- Mill and overlay for areas where new pavement is not needed
- Minor drainage work
- Lighting

Passing Lane Locations

- Remove existing rumble strips
- Reconstruct existing TH 53 shoulders to support thru traffic volumes
- Variable depth mill and overlay to remove crown from center of proposed passing lane
- Restripe lane geometry to provide center left turn lanes including transition areas

Modification to Existing Equipment

Not applicable

c. Project Magnitude

Table 3: Project Magnitude

Total Project Acreage	63.96 acres
Linear project length	10.66 miles
Number and type of residential units	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	N/A

d. Project Purpose

Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to improve safety and mobility conditions in the project corridor. The needs for improvements were described under the Project Description heading above. The beneficiaries include local and regional users of this stretch of TH 53.

e. Future Development

Are future stages of this development including development on any other property planned or likely to happen?

☐ *Yes* ☒ *No*

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

f. Previous Development

Is this project a subsequent stage of an earlier project? ☐ *Yes* ☒ *No*

If yes, briefly describe the past development, timeline and any past environmental review.

7 Cover Types

Estimate the acreage of the site with each of the following cover types before and after development:

Project construction and/or disturbance limits were used to define the study area footprint in **Table 4**, below.

Table 4: Cover Types

	Before	After		Before	After
Wetlands	1.87	0.7	Lawn/landscaping	N/A	N/A
Deep water/streams	N/A	N/A	Impervious surface	58.44	57.8
Wooded/forest	N/A	N/A	Stormwater Pond	N/A	N/A
Brush/Grassland	3.65	5.46	Other (describe)	N/A	N/A
Cropland	N/A	N/A			
			TOTAL	**63.96**	**63.96**

8 Permits & Approvals Required

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.

Permits and Approvals

All known permits at state, federal, and local levels necessitated by the project are listed in **Table 5**, below.

Table 5. Required Permits & Approvals

Government Agency	Type of Application/Permit	Status
Federal Agencies		
Federal Highway Administration	Categorical Exclusion	To be requested
MnDOT Cultural Resources Unit on behalf of FHWA	Section 106 (Historic/Archeological) Determination	Complete
MnDOT Office of Environmental Stewardship on behalf of FHWA	Endangered Species Act Section 7 Determination	Complete
United States Army Corps of Engineers (USACE)	Section 404 Wetlands Permit	To be requested
State Agencies		

Table 5. Required Permits & Approvals

Government Agency	Type of Application/Permit	Status
Minnesota Board of Water and Soil Resources (BWSR)*	Minnesota Wetland Conservation Act (WCA) Notification	To be provided
Minnesota Pollution Control Agency	National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit 401 Certification	To be requested
* Under the Minnesota Wetland Conservation Act, MnDOT is the Local Government Unit (LGU) for wetland impacts within roadway right-of-way for the project.		

Environmental Mitigation Commitments

Appendix B provides a summary of environmental mitigation commitments for this project. This summary is culled from information and assessments provided in the following EAW sections.

9 Land Use

a. Existing Land Use

Description

Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Only a negligible percentage of the land in or adjacent to the cumulative project area is designated as prime farmland by the United States Department of Agriculture. **Figure 10** identifies resource management areas and trails in the larger project area. More specific adjacent land use information for each project location, respectively, is provided under the following headings.

Location 1 – South TH 53/TH 1 Junction

See **Figure 2**. This location is in a rural, primarily forested area. There is a large equipment yard for a general contractor in the northwest quadrant of the intersection, and a fabricating shop in the southwest quadrant. The Superior National Forest is south and east of this project element; at its closest point, the Superior National Forest is approximately 0.8 mile east of the intersection (**Figure 10**).

Location 2 – North TH 53/TH 1 Junction

See **Figure 4.** This location is in a rural, primarily forested area, with scattered rural residential properties, a commercial business, and an agricultural field (hay) south of TH 1 and west of TH 53. In addition, there is an electrical substation east of CR 937 and north of CSAH 115. The Little Fork River State Water Trail is approximately one mile southeast of the this location at its closest point, and the Superior National Forest and Kabetogama State Forest are approximately 2.0 miles to the north (**Figure 10**).

Location 3 – Passing Lane Segment A (RP 98 to 100.5)

See **Figure 6**. The area is forested, with scattered rural residential properties and one contractor/aggregate business operation. This segment is within Superior National Forest and the Kabetogama State Forest (**Figure 10**).

Location 4 – Passing Lane Segment B (RP 118.5 to 121)

See **Figure 7**. The area is forested, with very limited adjacent development. Canadian Northern (CN) railroad tracks are adjacent to the highway on the west side; based on MnDOT information this line sees 17 trains per day on average. This segment is within Superior National Forest and the Kabetogama State Forest (**Figure 10**).

Location 5 – Passing Lane Segment C (RP 136.5 to 139)

See **Figure 8**. The area is forested, with scattered rural properties. There is one commercial property at the TH 53/Ash River Road intersection approximately 500 feet south of this segment. This segment is within the Superior National Forest and the Kabetogama State Forest. The Arrowhead State Trail is generally parallel to this segment to the east and is approximately 0.5 mile away at its closest point (**Figure 10**). This is primarily a snowmobile trail.

Location 6 – Passing Lane Segment D (RP 149 to 151.5)

See **Figure 9**. The area is generally forested, with scattered rural residential properties and miscellaneous structures primarily in the south half of the segment. CN railroad tracks are adjacent to the highway on the east side. As noted previously, this line sees 17 trains per day on average. The northwest tip of this segment is within the Koochiching State Forest (**Figure 10**).

Local Plans

Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

None of the project segments are within incorporated municipalities. Land use is under the jurisdiction of St. Louis County for project Locations 1 – 5, and under the jurisdiction of Koochiching County for Location 6. Planning information was gathered on a county basis.

Land use classifications relative to the individual locations of the proposed project as identified in the St. Louis County's 2018 draft *Comprehensive Land Use Plan* are as follows:

- Location 1 – South TH 53/TH 1 junction: Crossroads Commercial directly adjacent to the intersection, with a relatively large area bounded by TH 53 on the west, TH 1 on the south, Canadian Northern railroad tracks on the east, and CSAH 87 (Leander Road East) to the north identified as Industrial
- Location 2 – North TH 53/TH 1 junction: primarily Forest and Agriculture, with the area between general triangle bounded by TH 53, CSAH 115, and the Cook city limit identified as Community Growth
- Location 3 – Passing Lane Location A: Forest and Agriculture
- Location 4 – Passing Lane Location B: Forest and Agriculture

- Location 5 – Passing Lane Location C: Forest and Agriculture

In the *Koochiching County Comprehensive Land Use Plan* (November 2001), the land use categories map (Figure 2-7 from *Comprehensive Land Use Plan*) is based on the zoning map (Figure 2-6 from *Comprehensive Land Use Plan*). Land use identified in the vicinity of Passing Lane Segment D is a combination of Natural Resource, Rural Residential, Public Land, Agricultural, and Commercial areas identified.

Zoning

Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Based on St. Louis County Zoning information, project segments are surrounded by the following zoning areas:

Location 1 – South TH 53/TH 1 Junction: northwest/northeast/southeast quadrants in Multi-Use (MU)-5; southwest quadrant in Forest Agricultural Management (FAM)-3

Location 2 – North TH 53/TH 1 Junction: MU-5

Location 3 – Passing Lane Segment A: FAM-2

Location 4 – Passing Lane Segment B: FAM-3

Location 5 – Passing Lane Segment C: FAM-3

The Koochiching County Zoning Map (Figure 2-6 from the *Comprehensive Land Use Plan*, 2001) shows the majority of areas adjacent to Passing Lane Segment D as being identified as Open Space or Low Densityl Residential, with small areas zoned Agriculture-Forestry and Limited Commercial, respectively.

b. Project Compatibility

Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed project will require only limited right-of-way and will not notably change the overall character of the affected roadways. No new right-of-way will be required for Locations 1, 3, 4, 5, and 6. As depicted in **Figure 5**, approximately 1.02 acres of right-of-way are planned for acquisition for Location 2 from three properties. Two of these parcels are rural residential (0.94 acre acquisition and 0.01 acre acquisition in **Figure 5**), and the third is private undeveloped (0.07 acre acquisition in **Figure 5**). Construction limits are also depicted on **Figure 5**. The project is compatible with nearby land uses, zoning, and planning documents as discussed above. Therefore, the need for land use-related mitigation measures is not anticipated.

c. Project Incompatibility

Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

Please refer to Response 9b.

10 Geology, Soils, & Topography/Land Forms

Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Bedrock geology of the overall project area is relatively consistent and is composed generally of meta-igneous rocks (granitic gneiss, granite-rich migmatite, and greenstones), metasedimentary rock, and intrusive rocks (granite, granodiorite, and tonalite).[1] No karst or other sensitive geologic features are known to exist in the project areas. It is not anticipated that geologic conditions will affect or otherwise limit project design choices or construction activities.

a. Soils & Topography

Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

Tables summarizing soils for the six project segments, respectively, are provided in **Appendix C**. There is relatively limited potential for erosion in all project locations because of the lack of steep grades and the predominance of soils in hydraulic classifications D or C. Based on Natural Resource Conservation Service (NRCS) information these classes are described as follows:

- Group C – Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture.
- Group D – Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays with high swelling potential, soils with a permanent high water

[1] Geologic Map of Minnesota: Simplified Bedrock Geology. Mn/DOT. Howe, 2000.

table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

This soils information is readily supported by the extensive presence of wetlands, marshes, and bogs in this overall part of the state. While these soil conditions are desirable from an erodibility perspective, they tend to be poor in terms structural stability for road construction. Care will need to be given in final design to appropriate subgrade design for altered and/or expanded pavement footprint locations.

Based on preliminary design, the total area of soil disturbance is approximately 6.0 acres, and the total volume of soil excavation is approximately 20,000 cubic yards. The project will require a National Pollution Discharge Elimination System (NDPES) Construction Permit as administered by the Minnesota Pollution Control Agency, and a stormwater Pollution Prevention Plan (SWPPP) will be developed consistent with NPDES requirements. The SWPPP will identify best management practices (BMPs) that will be used during construction activities to limit the potential for erosion and sedimentation losses. More details on these BMPs is provided in Item 11.b (Stormwater Control heading), below.

11 Water Resources

a. Surface Water & Groundwater Features

Describe surface water and groundwater features on or near the site.

Surface Water

Describe lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Public Waters – One Mile Search Area

Table 6 identifies DNR public waters within one mile of each of the six project locations, respectively. Also identified are the public waters which are designated as Impaired by the Minnesota Pollution Control Agency. TH 53 throughout the overall project area has rural section design, which uses ditching for stormwater conveyance.

Table 6. Public Waters Information

Surface Water	Public Water Designation	Impaired Water?	Water Quality Impairment
South TH 53/TH 1 Intersection			
Rice River	09030005-517	Yes	AQL
Unnamed creek (Angora Creek)	09030005-534	No	N/A
Unassessed Stream (x2)	09030005-999	Unassessed	
North TH 53/TH 1 Intersection			

Surface Water	Public Water Designation	Impaired Water?	Water Quality Impairment
Rice River	09030005-502	Yes	AQC, AQL
Unassessed Stream (x2)	09030005-999	Unassessed	
Passing Lane Segment A			
Unassessed Stream (x3)	09030005-999	Unassessed	
Passing Lane Segment B			
Unnamed Creek (Lost River Tributary)	09030005-543	No	N/A
Lost River (stream)	09030005-538	No	N/A
Unnamed Creek (Lost River Tributary)	09030005-642	No	N/A
Unassessed Stream	09030001-999	Unassessed	
Passing Lane Segment C			
Unassessed Stream (x3)	09030001-999	Unassessed	
Passing Lane Segment D			
Unassessed Stream (x3)	09030001-999	Unassessed	
Unnamed Creek	09030003-627	No	N/A
Rat Root River, East Branch	09030003-510	No	N/A

Of the public waters identified in **Table 6**, Lost River south of Passing Lane Segment B, is a designated Trout Stream. No wildlife lakes, migratory waterfowl/resting lakes, or outstanding resource waters exist in the project areas.

Wetlands

National Wetland Inventory (NWI) information is provided in **Figures 2**, **4**, **6**, **7**, **8**, and **9** for the respective project locations. It may be noted that NWI generally under-represents wetlands in forested areas. As is generally true for this part of the state, wetland resources are prevalent along the overall project corridor. Wetland delineation and impact information is provided in Item 11.b, below.

Ground Water

Describe aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

For the majority of project segments there are residential wells present, and some also are near commercial wells and wells for analytical purposes. Depth to groundwater by project segment is summarized below. The wells in the overall project area generally obtain water from the Quaternary Buried Artesian Aquifer (QBAA), the Quaternary Buried Unconfined Aquifer (QBUA), or Quaternary Undifferentiated (QUUU), where aquifer data is available.

Location 1 – South TH 53/TH 1 Junction

Well log information from the general project segment suggests depth to groundwater (static water level) of 0 to 50 feet within the project area. This information was gathered by viewing the following well logs: 476459, 444408, 777376, 538507, and 563270.

Location 2 – North TH 53/TH 1 Junction

Well log information from the general project segment suggests depth to groundwater of 14 to 20 feet within the project area. This information was gathered by viewing the following well logs: 706260, 460413, 735942, and 145621.

Location 3 – Passing Lane Segment A 4

While no wells are present in the immediate project area, wells to the north and south approximately 0.5 miles from the project area suggest a depth to groundwater ranging from the surface to 27 feet within the project area. This information was gathered by viewing the following well logs: 476477, 555021, and 765164.

Location 4 – Passing Lane Segment B

While no wells are present in the immediate project area, wells exist to the north approximately 2.25 miles from the project area and suggest a depth to groundwater ranging from 2 to 10 feet within the project area. This information was gathered by viewing the following well logs: 769398 and 444417.

Location 5 – Passing Lane Segment C

One domestic well (165021) is present in south end of the project area, with depth to groundwater of 6 feet.

Location 6 – Passing Lane Segment D

Only one well (256878), designated as scientific investigation, is present within the project area, and the records do not provide a static water level. However, a domestic well (770488) located approximately 1 mile northwest along TH 53 has a depth to groundwater of 10 feet.

b. Project Effects & Mitigations

Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

Wastewater

For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

The project will not generate wastewater.

Stormwater

Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

Stormwater Quantity and Quality

In general, projects that increase impervious surfaces will correspondingly increase the stormwater runoff and potential for associated impacts. At Location 1 (south TH 53/TH 1 junction), impervious surface will increase from 1.2 acres to 1.36 acres, an increase of 13.3 percent. At Location 2 (north TH 53/TH 1 junction), impervious surface will decrease from 3.91 acres to 3.11 acres, a decrease of 20.5 percent. For the two intersection areas combined, the project is anticipated to result in a decrease of 0.64 acre impervious. The four passing lane portions of the project will not change the extent of impervious surfaces.

Runoff Routes

The stormwater design in all six project locations is rural section, using ditching and culverts to convey drainage.

South TH 53/TH 1 Intersection

Stormwater at the overall intersection is conveyed generally to the southeast, ultimately draining to the Rice River, which is approximately 2,000 feet to the southeast. The Rice River is an Impaired water for Fishes Bioassessments.

North TH 53/TH 1 Intersection

Stormwater is conveyed generally to the southeast, draining ultimately to the Little Fork River, which is approximately 1.0 mile southeast of the intersection. The Little Fork River is an Impaired water for mercury in fish tissue and turbidity.

Passing Lane Segment A

The southerly 1.5 miles of this segment drains to the southeast to Flint Creek which is approximately 1.0 mile to the southeast of the segment. This is a public water but not a special water. The northerly 1.0 mile of this segment drains to the northwest to an unnamed creek which passes under the northern edge of the segment. This is a public water, but not a special water.

Passing Lane Segment B

The southerly 2.0 miles of this segment drains to the south-southeast to Lost River, which crosses under TH 53 approximately 500 feet southeast of this segment. Lost River is a designated Trout Stream. The northerly 0.5 mile of this segment drains to an unnamed stream which runs generally parallel to the

highway on its east side and drains ultimately to Ash Lake, approximately 2.0 miles to the northwest. The unnamed stream is not a public water.

Passing Lane Segment C

This segment drains to a tributary running west from the middle portion of the segment to the Lower East Branch Rat Root River approximately four miles west of the highway. This tributary is not a public water.

Passing Lane Segment D

This segment drains either directly or indirectly to a tributary to the East Branch Rat Root River, which is approximately one mile east of the highway. The tributary flows under TH 53 approximately 0.5 mile south of the northerly limit of this segment. The tributary and East Branch Rat Root River are public waters, but are not special waters.

Stormwater Controls

The project will require a National Pollutant Discharge Elimination System (NPDES) Construction permit as administered by the MPCA. The NPDES permit requires a Stormwater Pollution Prevention Plan (SWPPP) that will define best management practices (BMPs) which will be used during construction activities. The specific BMP program will be determined through final design activities, but it is anticipated to include some combination of the following:

- Siltation fences, bio-rolls, wood-chip cover
- Temporary outlet protection
- Temporary ponding where appropriate/feasible
- Limiting exposed areas where feasible through construction phasing and other measures
- Timely placement of permanent cover including topsoil, seed and mulch, and sod or hydro-seeding

Because approximately two miles of Location 4 drains to a designated Trout Stream as referenced above, that portion of the project will need to comply with Item 23.9 of the August 1, 2018 NPDES Construction Stormwater General Permit:

> *Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases. [Minn. R. 7090].*

Item 23.10 (applicable threshold is not met) and Item 23.11 (Location 4 project limits are greater than 100 feet from Lost River) do not apply for this project relative to Trout Stream protection under NPDES.

Cured In Place Plastic (CIPP) liners will not be used as part of culvert work for the project.

As noted previously, the proposed project will result in a net decrease in the area of impervious surface. Therefore, a permanent stormwater management system to control runoff will not be required under NPDES. The NPDES threshold regarding permanent control requirements is one acre or more of new impervious surface.

Water Appropriation

Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

It is not anticipated that the project will require dewatering activities. A MnDNR Water Appropriations permit would be obtained prior to construction if it is determined that dewatering activities are required.

Surface Waters

Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

Wetlands

Delineated Wetlands

The wetland review for this project applied a Level 3 MnDOT approach for delineation, which is a combination of Level 1 (desktop data review, onsite inspection unnecessary) and Level 2 (requires onsite inspection) procedures. Level 1 delineation procedures were used for highway median areas, and Level 2 procedures for all other project areas. The Level 1 and Level 2 analyses were performed by Short Elliot Hendrickson (SEH) in accordance with applicable federal and state regulatory standards and guidelines.[2] SEH completed the Level 2 fieldwork on October 12, 2018. The results, as well as anticipated impacts, are depicted in **Figure 11** for location 1 and **Figure 12** for Location 2.

Wetland delineations were not performed for Locations 3 through 6 because no impacts are anticipated. The majority of the overall passing lane work will be within the existing roadway footprint, and will not appreciably affect ditch sideslopes. The only instances where construction will be required beyond the existing gravel shoulder would be on curves to address superelevation factors; two curves exist in Location 4 and one in Location 5. The proposed 1:4 ditch tie-ins (steeper than the existing 1:6 grades) will keep ditch work associated with the superelevation conditions well clear of ditch bottoms and

[2] *Wetland Delineation Report – Junction of Trunk Highway 1 (County State Aid Highway 22)/Trunk Highway 53 & Junction of Trunk Highway 1 (County Road 115)/Trunk Highway 53*, Short Elliot Hendrickson, November 2018. Fieldwork completed October 12, 2018.

potential wetland resources. The length of the passing lane areas affected by curves regarding the sideslope design as identified above is approximately three percent of the combined total passing lane project area length and only on the outside shoulder of the curve.

Table 7 provides summary information for the Level 1 wetland areas and anticipated impacts, and **Table 8** provides this information for Level 2 wetland areas and anticipated impacts. Refer **to Figure 11** for Location 1 delineated wetlands, **Figure 12** for Location 2. **Table 9** provides project-wide summary information by Cowardin Wetland Type.

Table 7. Level I Delineation Wetlands Summary

Wetland ID	Eggers & Reed Classification	Circular 39/Cowardin Classification	Temporary Impacts	Permanent Impacts
16	Fresh (wet) Meadow / Wet Ditch	Type 2 / PEM1B	0.19 Acre	0.04 Acre
17	Fresh (wet) Meadow / Wet Ditch	Type 2 / PEM1B	0.07 Acre	0.02 Acre
Total			0.26 Acre	0.06 Acre

Table 8. Level II Delineation Wetlands Summary

Wetland ID	Eggers & Reed Classification	Circular 39/Cowardin Classification	Temporary Impacts	Permanent Impacts
1	Sedge Meadow	Type 2 / PEM1B	0.01 Acre	35 SF
2	Shallow Marsh / Wet Ditch	Type 3 / PEM1C	None	None
3	Fresh (wet) Meadow	Type 2 / PEM1B	0.05 Acre	0.25 Acre
3 cont.	Coniferous Swamp	Type 7 / PFO4B	371 SF	0.04 Acre
4	Fresh (wet) Meadow	Type 2 / PEM1B	0.02 Acre	0.02 Acre
5	Sedge Meadow	Type 2 / PEM1B	0.03 Acre	0.02 Acre
6	Shallow Marsh / Wet Ditch	Type 3 / PEM1C	245 SF	258 SF
7	Shallow Marsh / Wet Ditch	Type 3 / PEM1C	None	None
8	Shallow Marsh / Wet Ditch	Type 2 / PEM1B	0.04 Acre	0.09 Acre
9	Sedge Meadow	Type 2 / PEM1B	0.08 Acre	0.05 Acre
10	Fresh (wet) Meadow	Type 2 / PEM1B	0.07 Acre	0.16 Acre
10 cont.	Shrub-Carr	Type 6 / PSS1B	None	None
11	Fresh (wet) Meadow	Type 2 / PEM1B	0.12 Acre	0.42 Acre
12	Fresh (wet) Meadow	Type 2 / PEM1B	None	None
13	Fresh (wet) Meadow	Type 2 / PEM1B	None	None
14	Fresh (wet) Meadow	Type 2 / PEM1B	0.01 Acre	0.06 Acre
14 cont.	Hardwood Swamp	Type 7 / PFO1B	None	None

15	Fresh (wet) Meadow	Type 2 / PEM1B	None	None
Total			0.44 Acre	1.11 Acre

Table 9. Total Wetland Impacts by Wetland Type

Cowardin Wetland Type	Temporary Impacts	Permanent Impacts
Type 2	0.69 Acre	1.13 Acre
Type 3	245 SF	258 SF
Type 6	None	None
Type 7	371 SF	0.04 Acre
Total	0.7 Acre	1.17 Acre

Permitting and Sequencing Information

The project will comply with all applicable federal and state wetland regulatory requirements. It is anticipated that the project will require a Section 404 permit from the US Corps of Engineers (USCOE). Under the Minnesota Wetland Conservation Act (WCA), MnDOT will be the designated Local Government Unit (LGU) with regulatory authority consistent with Minnesota Board of Water and Soil Resources (BWSR) guidelines.

Avoidance

For Location 1 and Location 2, it is not possible to completely avoid all wetland impacts. The No Action alternative would avoid all impacts but would not address the transportation needs described in Item 6.b, above. As referenced previously, wetlands are prevalent along the project location on both sides of the highway. There are no locational or design alternatives meeting the project need that would result no wetland impacts.

Minimization

The current highway alignment will be used for locations 1 and 2, which will limit the potential for wetland impacts, given the prevalence of wetlands on both sides of the highway.

For Location 2, two alternatives were considered but rejected; layouts are provided in **Appendix D**. Under Alternative 1, the currently off-set west and east legs of the TH 53/TH 1/CSAH 115 intersection are directly aligned with each other at a 90° intersection located approximately 900 feet southeast of the current intersection area. Alternative 2 had two sub-options, both of which bring the west and east legs, respectively, into 90° degree T intersections with TH 53, and move these junctions well apart from each other (0.58 mile apart or 0.92 mile apart, depending on the sub-option). From a transportation/safety perspective, both of the alternatives summarized above would have been preferred to the selected design. However, they would have had substantially more local and environmental impacts, and were not selected.

For Locations 3 – 6 (passing lane segments), existing alignments will be used. As discussed previously, the proposed 1:4 sideslope tie-ins (steeper than the existing 1:6 grades) will keep any sideslope work well clear of potential wetland resources associated with ditch bottoms.

Mitigation

For unavoidable wetland impacts, replacement areas will be established at an anticipated 1:1 ratio per Section 404 and WCA requirements. Mitigation will be performed within BWSR Bank Service Area 2.

As depicted in **Figure 5**, the current TH 1 and CSAH 115 intersection legs at Location 2 will be removed. It is likely that these roadway removal areas will naturally become wetlands over time due to adjacent wetland conditions. However, MnDOT would not consider these as formal mitigation areas, and would use an off-site mitigation bank or banks meeting regulatory requirements to comply with Section 404 and WCA permit requirements.

Other Surface Waters

Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

Surface water features other than wetlands as described in **Item 11b**, above, will not be directly or indirectly affected by physical modification.

12 Contamination/Hazardous Materials/Wastes

a. Pre-project Site Conditions

Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The Contaminated Materials Management Team (CMMT), part of the MnDOT's Office of Environmental Services, reviewed the proposed project regarding the potential to encounter contaminated properties. This included a review of the Minnesota Pollution Control Agency and Minnesota Department of Agriculture databases for known contaminated sites. This search identified one closed unpermitted dump site in the vicinity of Reference Post 136.6 within approximately 500 feet of the project area.

The CCMT concluded that that the project has a low risk of impacting potentially contaminated sites and that no further evaluation is necessary based on the current project design and the following considerations:

- A review of the environmental databases referenced above.
- Project excavation and grading will be moderate for intersection and lane construction; however, because the work is in a rural, minimally developed area, this decreases the chances of encountering contaminants that may have originated from an off-site source and migrated into the right-of-way.
- The project requires no groundwater dewatering.

The CCMT correspondence for the project is provided as **Appendix E**. In the unlikely event of encountering contamination during construction activities, MnDOT will require the contractor handle such material in accordance with applicable state, federal regulations, and MnDOT standard specification 1717.

b. Project Related Generation/Storage of Solid Wastes

Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

The proposed project will utilize conventional roadway construction techniques and materials, and the generation of unusual or problem waste streams is not anticipated. The contractor will be required to ensure that all waste materials are disposed of in accordance with applicable federal, state, and local regulations.

c. Project Related Use/Storage of Hazardous Materials

Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

The only chemicals/hazardous materials which may be present on-site during the construction include petroleum products such as fuel and other engine fluids for maintaining construction equipment. No above- or below-ground storage tanks are planned for use during the construction project. Any hazardous materials used during construction will be stored in leak-proof containers and locked away while not in use.

If a spill of chemical/hazardous material should occur during construction activities, the Minnesota Duty Officer will be notified as necessary. The construction contract will require that the contractor be

responsible for containing any chemical/hazardous spill, and disposing of resulting wastes in accordance with applicable regulatory requirements.

d. Project Related Generation/Storage of Hazardous Wastes

Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Please see Items 12b and 12c.

13 Fish, Wildlife, Plant Communities, & Sensitive Ecological Resources (Rare Features)

a. Resources/Habitats/Vegetation

Describe fish and wildlife resources as well as habitats and vegetation on or near the site.

As discussed previously, the project has six locations along an approximately 65-mile corridor. Existing conditions are depicted in **Figures 2**, **4**, **6**, **7**, **8**, and **9** for project locations 1, 2, 3, 4, 5, and 6, respectively. All of the locations are in rural settings, with adjacent forest areas including extensive wetlands and bogs. Locations 1, 3, 4, 5, and 6 will be entirely within roadway right-of-way. At location 2 (north TH 53/TH 1 junction) a total of approximately 1.02 acres of right-of-way will be required from three parcels as depicted in **Figure 5** and addressed in Item 9.b. Project Locations 3, 4, and 5 are within the Superior National Forest and the Kabetogama State forest. The northwest tip of Location 6 is within the Koochiching State Forest.

Public waters in or near the project area were summarized in Item 11.a and 11.b, above. The southerly 2.0 miles of Location 4 (Passing Lane Segment B) drains to the south-southeast to Lost River, which crosses under TH 53 approximately 500 feet southeast of this segment. Lost River is a designated Trout Stream. None of the other segments drain directly to special waters. The project will not involve work in public waters.

Wetland resources in the project area were discussed in Item 11.B, above. Please refer to **Figure 11** for Location 1 delineated wetlands and anticipated impacts and **Figure 12** for Location 2 wetland information.

b. Rare Features

*Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB **20170450**) from which the*

data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

MnDOT received Early Notification Memo (ENM) correspondence from the Minnesota Department of Natural Resources (DNR) in an email dated November 19, 2018. This correspondence included a Natural Heritage Information System (NHIS) review for the project. An ERDB number was not provided; however, the DNR information is provided in **Appendix E**.

The DNR correspondence identifies that Location 5 (Passing Lane Segment C) passes through bogs and wooded wetlands (white cedar swamp) that contain rare plant species, including three of special concern species: White Adder's Mouth (*Malaxis monophyllos var. brachypoda*), Lapland Buttercup (*Ranunculus lapponicus*), and Northern Oak Fern (*Gymocarphium robertianum*). The DNR indicates that there are no known locations of these species within MnDOT right-of-way, where the work will take place.

The DNR correspondence identifies that the northern long-eared bat may be in the project area, and also notes that there are no known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

c. Project Effects

Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

All but a small portion of the project will take place within MnDOT right-of-way (see Item 9.b). The affected existing and proposed future right-of-way areas are generally grassed roadway ditch areas. As discussed in Item 11.b, above, the project as proposed will result in a total of 1.17 acres of permanent wetland impacts (see **Figure 11** and **Figure 12**). In addition, the project as proposed will result in the removal of approximately 0.05 acre of trees as depicted in **Figure 5**.

The introduction of exotic, non-native, or invasive species can change a diverse native plant community into a monotype of undesirable species. The spread of invasive species will be limited by construction Best Management Practices (BMPs) including compliance with MnDOT's 2018 Standard Specifications for Construction, Section 2572.

d. Control Measures

Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Construction plans for Location 5 (Passing Lane Segment D) will include 'Area of Environmental Sensitivity' labeling, and associated construction BMPs will be used. Surficial stormwater flow patterns will not be altered and no changes to culvert elevations are proposed.

As noted previously, there are no known northern long-eared bat roosting trees or hibernaculum within 1.0 mile of any of the project locations. Tree removal will not take place during the peak birthing period of June 1 through July 31 per US Fish and Wildlife guidelines. Federal documentation requirements for the northern long-eared bat are being addressed through a separate National Environmental Policy Act (NEPA) Categorical Exclusion process which is currently underway for the proposed project.

Wetland sequencing for the project (avoid, minimize, mitigate) was discussed in Item 11.b, above. Unavoidable wetland impacts will be mitigated through the use of a federally approved wetland bank in accordance with all applicable regulatory requirements.

Best Management Practices in compliance with National Pollutant Discharge Elimination (NPDES) permit requirements will be deployed for the project. These BMPs, as discussed in Item 11.b above, will limit the potential for stormwater-related impacts to biotic resources during construction activities.

14 Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The proposed project was reviewed by MnDOT's Cultural Resources Unit (CRU) for historic and archaeological resources. This review was conducted pursuant to CRU's FHWA-delegated responsibilities for compliance with Section 306108 (previously known as Section 106 of the National Historic Preservation Act [54 USC 300101 et. seq.]), and as per the terms of the 2015 Section 106 Programmatic Agreement between the FHWA and the Minnesota State Historic Preservation Office (SHPO). This review was also conducted pursuant to MnDOT's responsibilities under the Minnesota Historic Sites Act (MS 138.665.666), the Field Archaeology Act of Minnesota (MS 138.40), and the Private Cemeteries Act (MS 307.08, Subd. 9 and 10).

Appropriate tribal representatives were sent a letter inquiring if they wished to be a consulting party for the project. No response was received. The Minnesota Indian Affairs Council and the Office of the State Archaeologist were also sent a letter to determine if those agencies were aware of resources relative to the proposed project that may not be in the State Historic Preservation Office (SHPO) database. No response was received.

Based on the review as summarized above, the CRU made a determination of *no historic properties affected* by the project as currently proposed. Refer to **Appendix E**, for the correspondence.

15 Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The proposed project locations are within an existing highway corridor, surrounded primarily by forested areas. The project will not notably change the visual characteristics of the highway relative to its context. The project will not impair the ability to enjoy the natural features along the overall corridor. Mitigation measures regarding visual impacts are not required.

16 Air

a. Stationary Source Emissions

Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

b. Vehicle Emissions

Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The project is not located in an area in which conformity requirements apply, and the scope of the project does not indicate that air quality impacts would be expected (the intersection improvements and passing lane segments do not expand overall capacity). Therefore, no further air quality analysis is necessary.

Mobile Source Air Toxics

The purpose of this project is to improve the safety and mobility characteristics of the overall corridor by constructing intersection and passing lane improvements. This project has been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause a meaningful increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, Environmental Protection Agency (EPA) regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES2014 model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

c. Dust & Odors

Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

During construction, particulate matter emissions will temporarily increase due to the generation of fugitive dust. The following dust controls measures will be undertaken as necessary:

- Minimize the period and extent of areas being exposed or regraded at any one time.
- Spray construction areas and haul roads with water, especially during periods of high wind or high levels of construction activity.
- Minimize the use of vehicles on unpaved surfaces.
- Cover or spray with water material piles and truckloads.

Construction dust and exhaust from construction equipment may have a temporary impact on air quality. Carbon monoxide and other vehicle related pollutants may also increase in areas under construction due to reductions in traffic capacity, lane closures, and other construction related delays. Any such impacts would be temporary in nature and typical for road construction projects of this nature.

17 Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

a. Construction Noise

During construction, it is unavoidable that noise levels will increase in the immediate area surrounding the project site. The actual noise levels on and adjacent to the site will vary considerably depending on the numbers and types of equipment being operated at any given time. **Table 10**, below shows peak

noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, which is generally the roadway construction phase associated with the greatest noise levels.

Table 10:	Typical Construction	Equipment	Noise Levels	at 50 Feet
Equipment	Manufacturers	Total Number of	Peak Noise	Level (dBA*)
	Sampled	Models in Sample	Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101
* units of "A-	weighted decibels"			
Source:	United States	Environmental Protection	Agency and	Federal Highway Administration

Construction activities will be temporary in duration. The contractor will be required to comply with applicable local ordinance requirements regarding noise. Construction equipment will be required to have factory installed mufflers or their equivalents in good working order during the life of the construction contracts. While it is possible that limited night construction may be required for this project, it is anticipated that construction activities will take place during the less noise-sensitive daylight hours. Pile driving will not be required for this project. Jack-hammering and concrete sawing will not take place during the nighttime hours. The loudest construction activities will only take place on a given portion or portions of the corridor at one time. The total duration of the project will be one construction season.

b. Traffic Noise

The information provided under the following headings is a summary of the full *TH 53 Intersection Improvement and Passing Lane Noise Impact and Mitigation Assessment Report* (SBP Associates, December, 2018), found in **Appendix F**.

Regulatory and Analytical Background

In Minnesota, noise impacts are defined by Federal regulations. In 2016, the Commissioners of the Minnesota Pollution Control Agency (MPCA) and MnDOT agreed that the traffic noise regulations and mitigation requirements from the FHWA are sufficient to determine reasonable mitigation measures for highway noise. By this agreement, existing and newly constructed segments of highway projects under MnDOT's jurisdiction are statutorily exempt from Minnesota State Noise Standards (MN Rule 7030) if the project applies the FHWA traffic noise requirements. As a result, any required noise analysis will follow FHWA criteria and regulations only.

This project, therefore, will address the noise impacts relative to the Federal Noise Abatement Criteria (NAC). For residential and recreational uses (Federal Land Use Category B), the Federal Leq[3] standard is 67 "A-weighted decibels" (dBA) for both daytime and nighttime. For commercial areas (Federal Land Use Category C), the Federal Leq standard is 75 dBA for both daytime and nighttime. Locations where noise levels are "approaching" (defined in Minnesota as being within one decibel of the criterion threshold i.e. 66/74 dBA) or exceeding the criterion level must be evaluated regarding the effectiveness, feasibility, and reasonableness of noise abatement measures (e.g. noise walls).

In addition to the comparison against NAC levels as discussed above, the FHWA defines a noise impact as a "substantial increase" in future noise levels over existing noise levels. MnDOT considers an increase of five dBA or greater a substantial noise level increase.

Analytical Procedures

Existing (2019) and future (2039) build and no-build noise levels were modeled using the FHWA Traffic Noise Model (version 2.5) software. 2019 defines existing conditions in this analysis because this is the year the project is to be constructed. The modeled noise levels for this year are representative of current noise levels.

Traffic noise impacts were assessed by modeling loudest hour 2019 and 2039 future build and future no-build Leq noise levels at receptor sites located within the project study areas. Loudest noise hour traffic is based on a modeling analysis of noise levels in order to ascertain the loudest daily hourly traffic flow rate and classification.

In addition to the noise modeling, noise monitoring was also conducted at one location representing a receptor site for each of the six project locations. The monitoring was conducted to confirm existing noise levels and to assist in validating the noise model results.

Noise modeling receptors were identified at commercial and residential sites along the six project locations. Receptor locations were chosen based on guidance provided in Appendix A of the 2017 MnDOT Noise Requirements. A combined total of 23 receptor locations were identified for the full project.

Results and Findings

Modeled existing (2019), 2039 build, and 2039 no-build noise levels did not approach the Federal Noise Abatement Criteria at any of the receptor locations (no results equal to or greater than 66 dBA). Additionally, modeled noise level increases between 2019 and 2039 were less than 5 dBA at all modeled receptor locations. No further noise analysis is required.

[3] The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period. In effect it is analogous to the "average" sound level over a given period of time.

18 Transportation

a. Project-Related Traffic

Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The proposed project will not add any new parking spaces and will not be a source of new vehicle trips.

b. Potential Congestion

Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: http://www.dot.state.mn.us/accessmanagement/resources.html) or a similar local guidance,

The proposed project will not add traffic or otherwise increase congestion levels. As previously discussed, it will improve operational and safety conditions at the two intersection locations and will improve mobility conditions at the passing lane locations.

19 Cumulative Potential Effects

a. Geographic Scales & Timeframes

Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

Considering the evaluation of potential effects from the proposed project in the preceding sections of this EAW, the relevant geographic scale of environmental effects includes the roadway corridor and adjacent land uses, as well as adjacent wetlands and receiving waters for project drainage. The construction phase of the project will last one construction season.

The proposed project elements and any associated potential for post-construction environmental effects will be in place for many years to come.

b. Future Projects

Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

As discussed under the Local Plans heading in Item 9 (Land Use) above, future development could take place in proximity the south and north TH 53/TH 1 intersections. Land use designations in the 2018 draft *St. Louis County Comprehensive Land Use Plan* include:

- South TH 53/TH 1 Intersection: Crossroads Commercial directly adjacent to the intersection, with a relatively large area bounded by TH 53 on the west, TH 1 on the south, Canadian Northern railroad tracks on the east, and CSAH 87 (Leander Road East) to the north identified as Industrial
- North TH 53/TH 1 Intersection: Community Growth within the general triangle bounded by TH 53, CSAH 115, and the Cook city limit

The timing and precise nature of such development is not known. It may not happen well into the foreseeable future.

There are no known development or other construction projects of notable scale which would be close to the passing lane segments covered in this document.

c. Discussion/Summary of Cumulative Potential Effects

Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

It is possible that future development in proximity with the proposed south and north TH 53/TH 1 intersections would affect the same resources as the proposed improvements. All future projects will need to meet applicable regulatory requirements for drainage, wetlands, and other applicable environmental parameters. The proposed project elements, when viewed in combination with potential future nearby development, do not present unusual environmental protection challenges that cannot be addressed through conventional regulatory procedures and controls. Conversely, the proposed project will not limit the ability to permit adjacent projects and provide the appropriate environmental controls for those projects.

20 Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

No additional potential environmental effects have been identified.

RGU CERTIFICATION

*The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature Jon P Sobotz Date 12-19-18

Title Chief Environmental officer

Figures

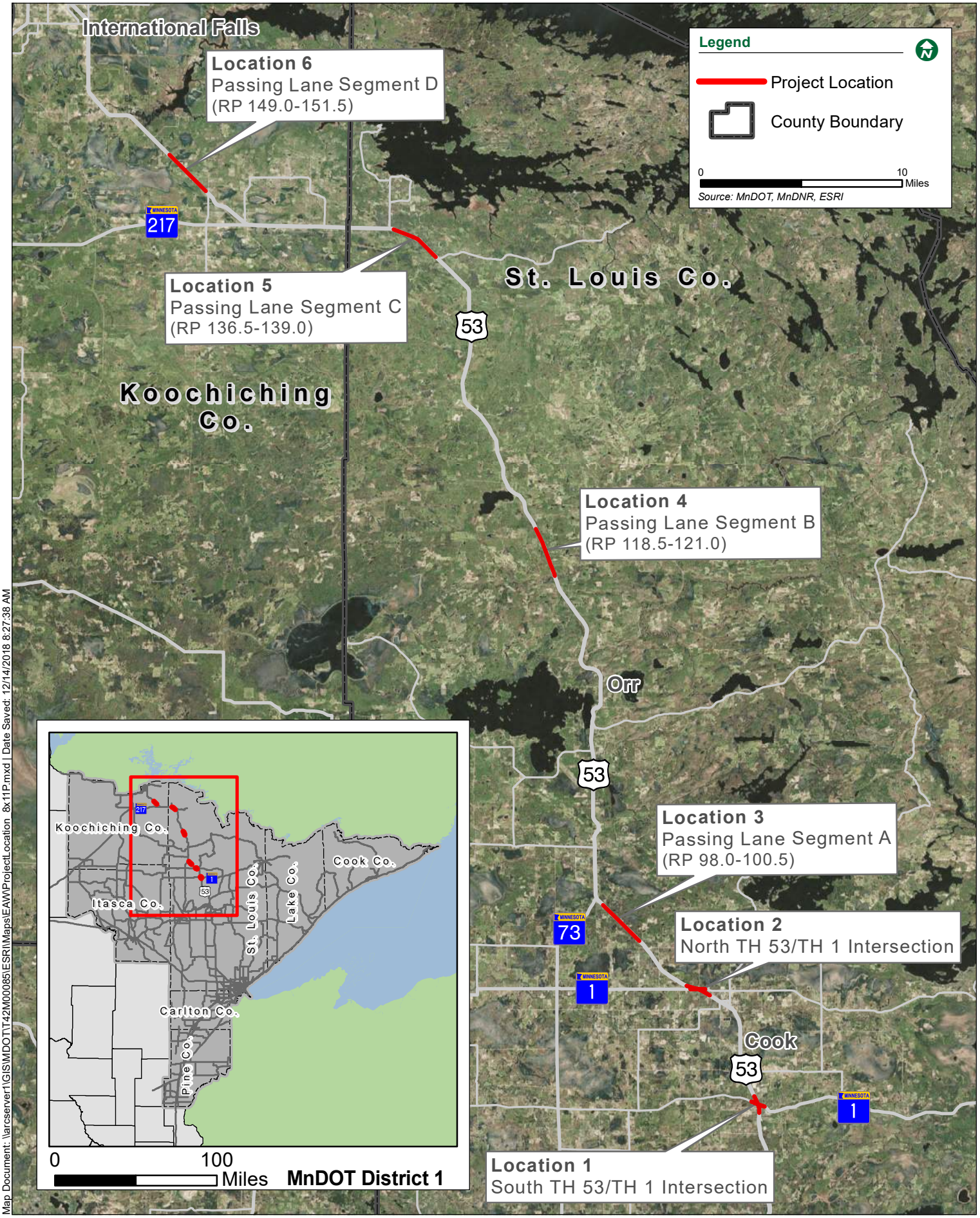


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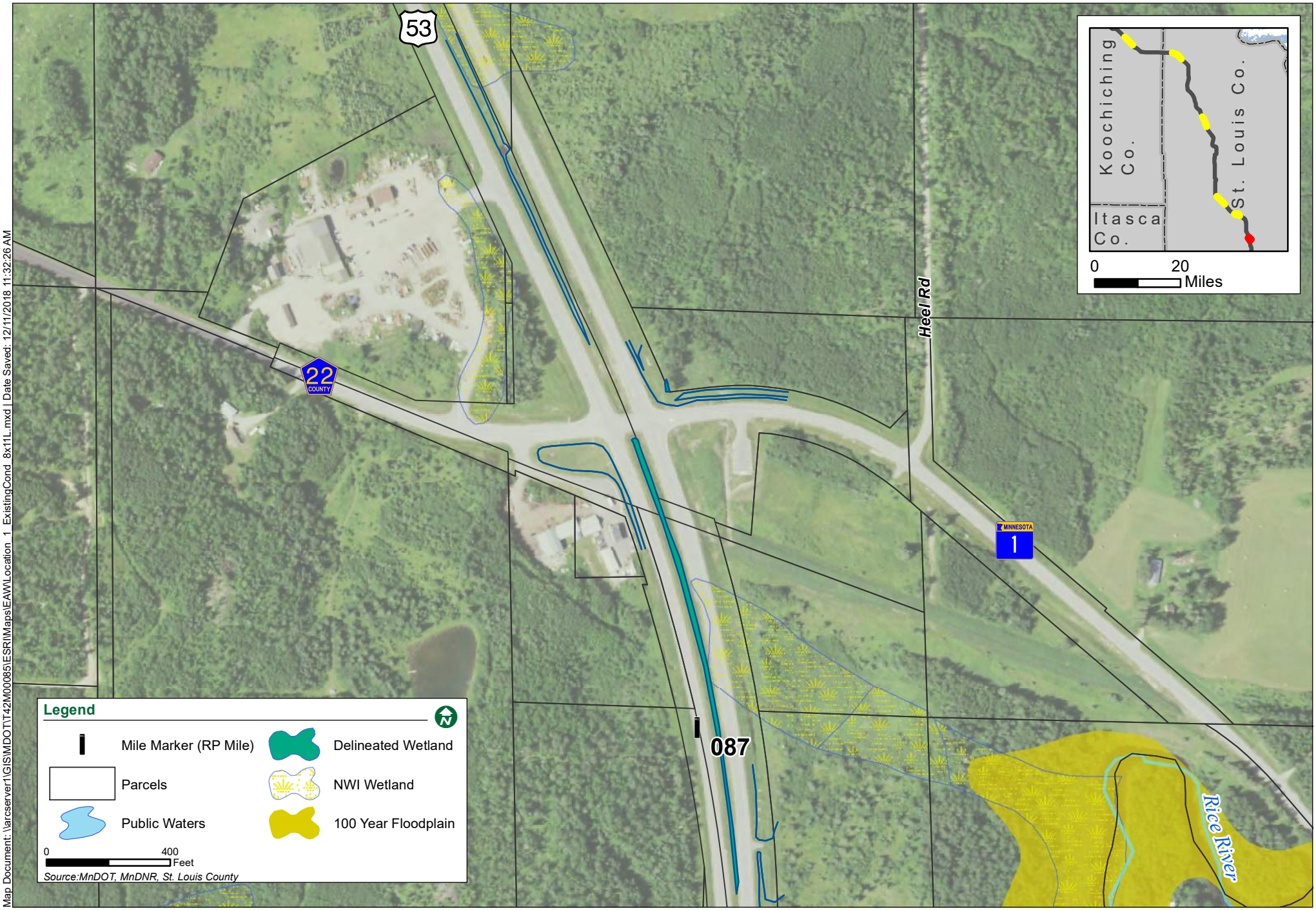
Figure 2: Location 1 - South TH 53/TH 1 Intersection Existing Conditions

December 2018



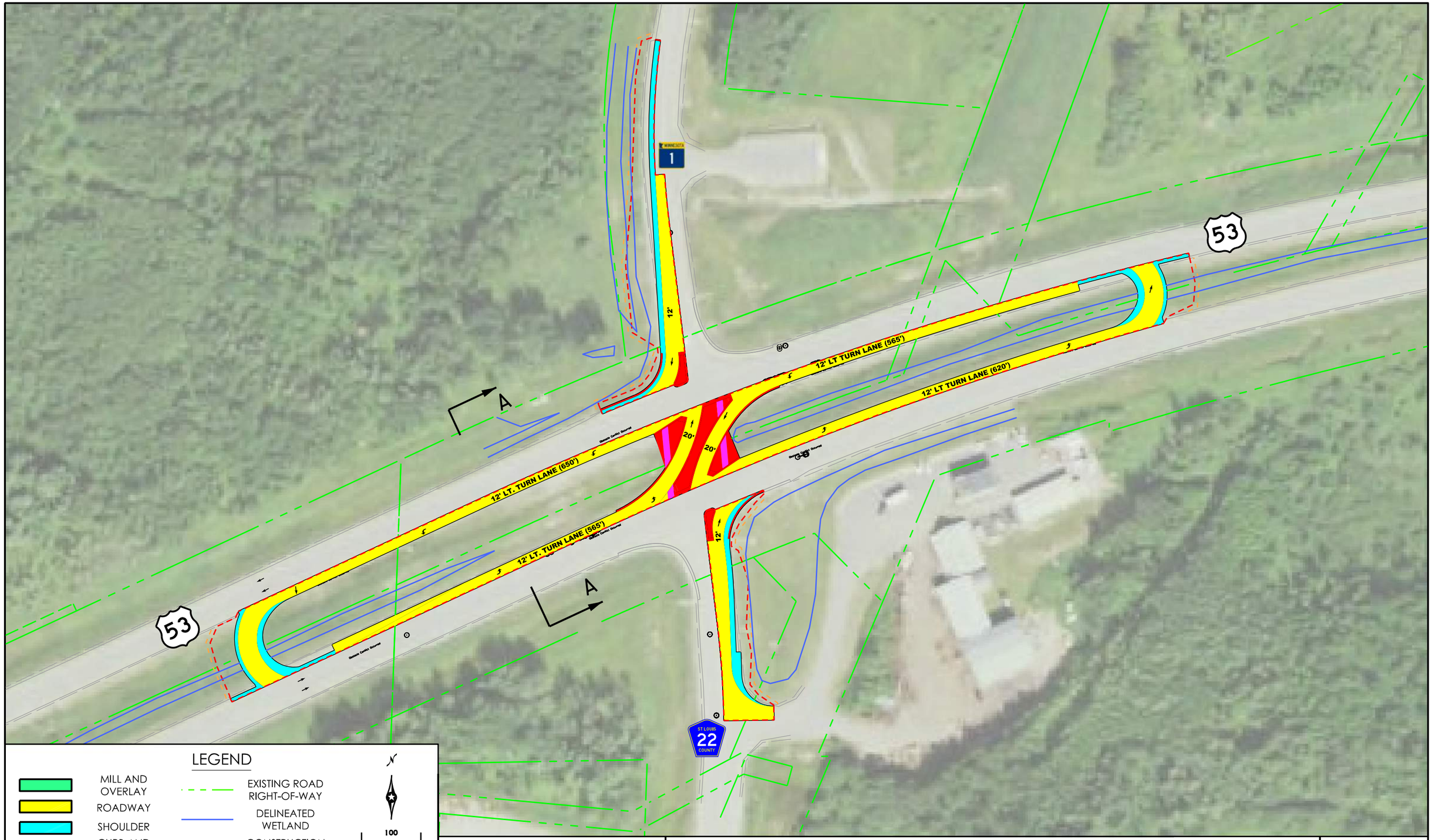


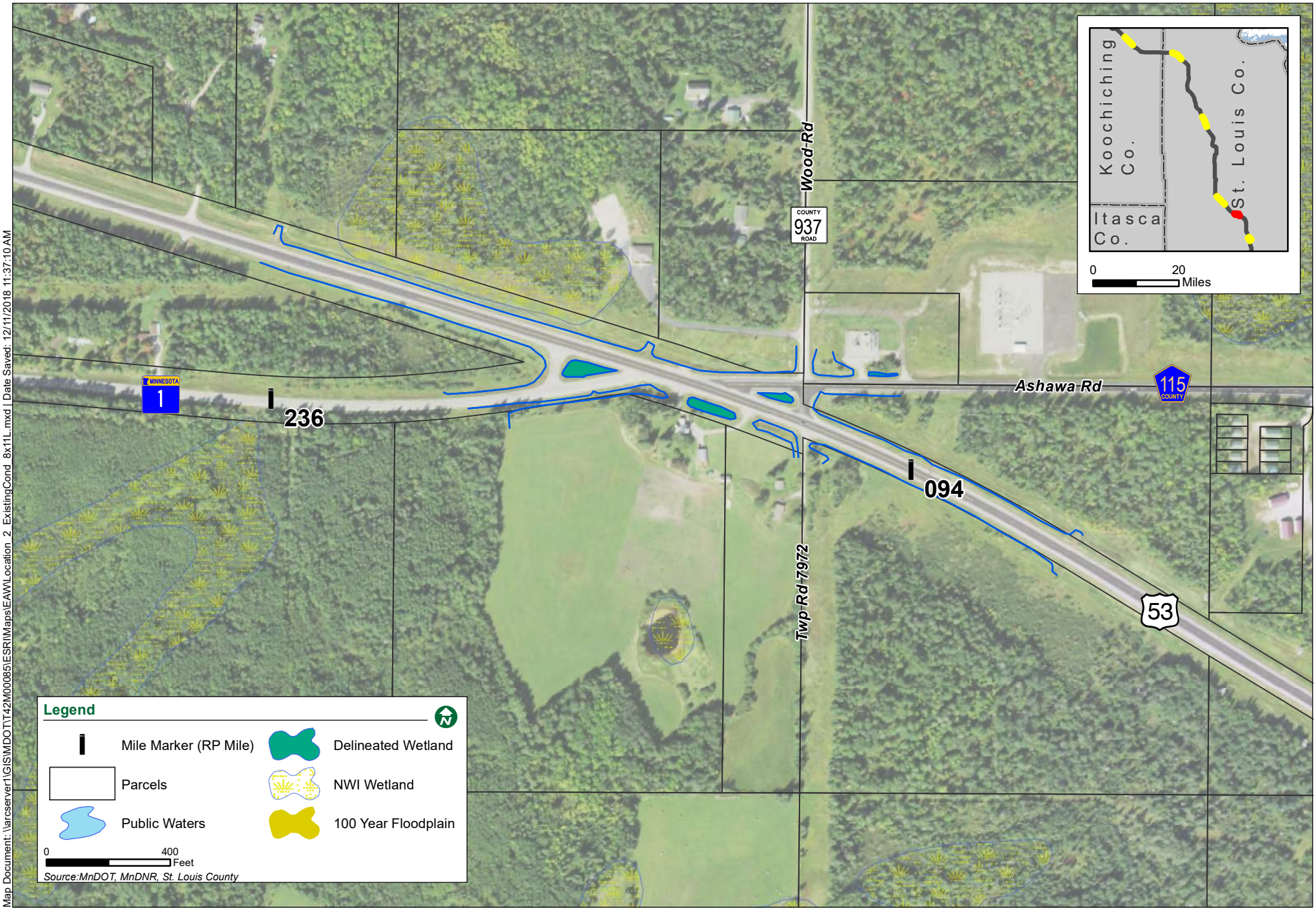
Figure 3: South TH 53/TH 1 Junction Proposed Improvements

TH 53 Intersection and Passing Lane Improvements

DEPARTMENT OF TRANSPORTATION

Figure 4: Location 2 - North TH 53/TH 1 Intersection Existing Conditions

December 2018



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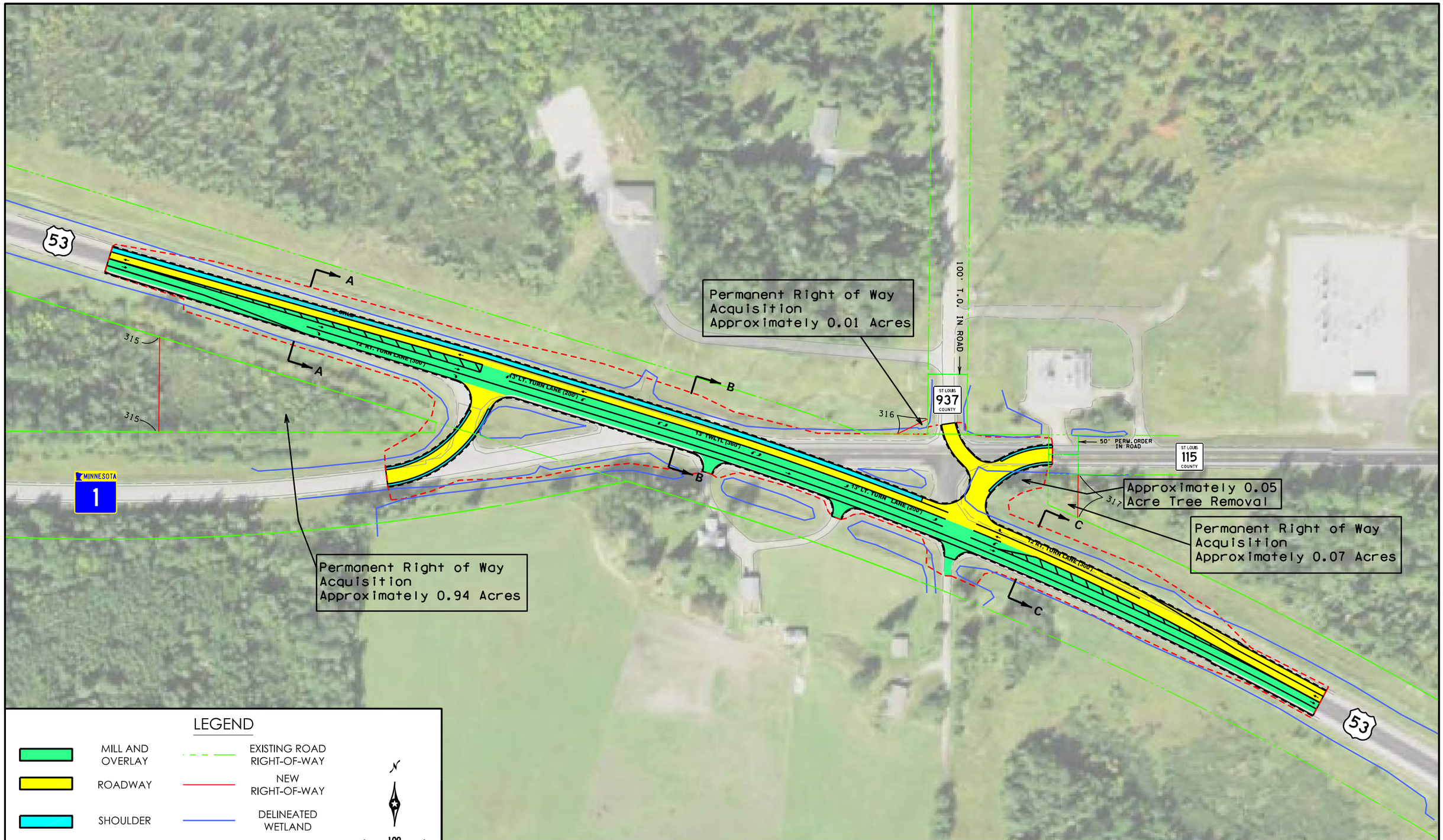


Figure 5: North TH 53/TH 1 Junction Proposed Improvements

TH 53 Intersection and Passing Lane Improvements

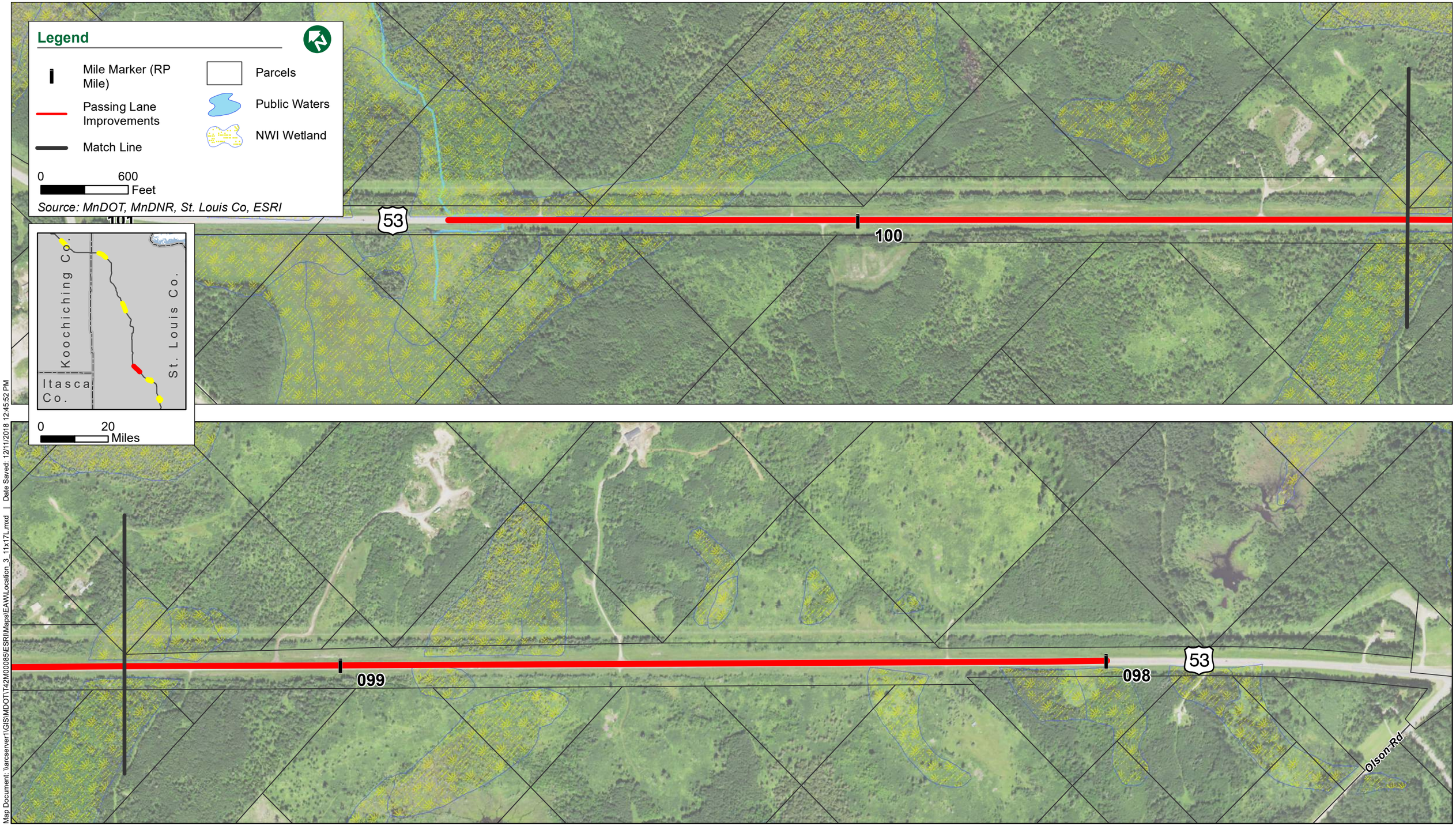
DEPARTMENT OF TRANSPORTATION

TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

Minnesota Department of Transportation

Figure 6:
Location 3 - Passing Lane Segment A

December 2018



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DEPARTMENT OF TRANSPORTATION

TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

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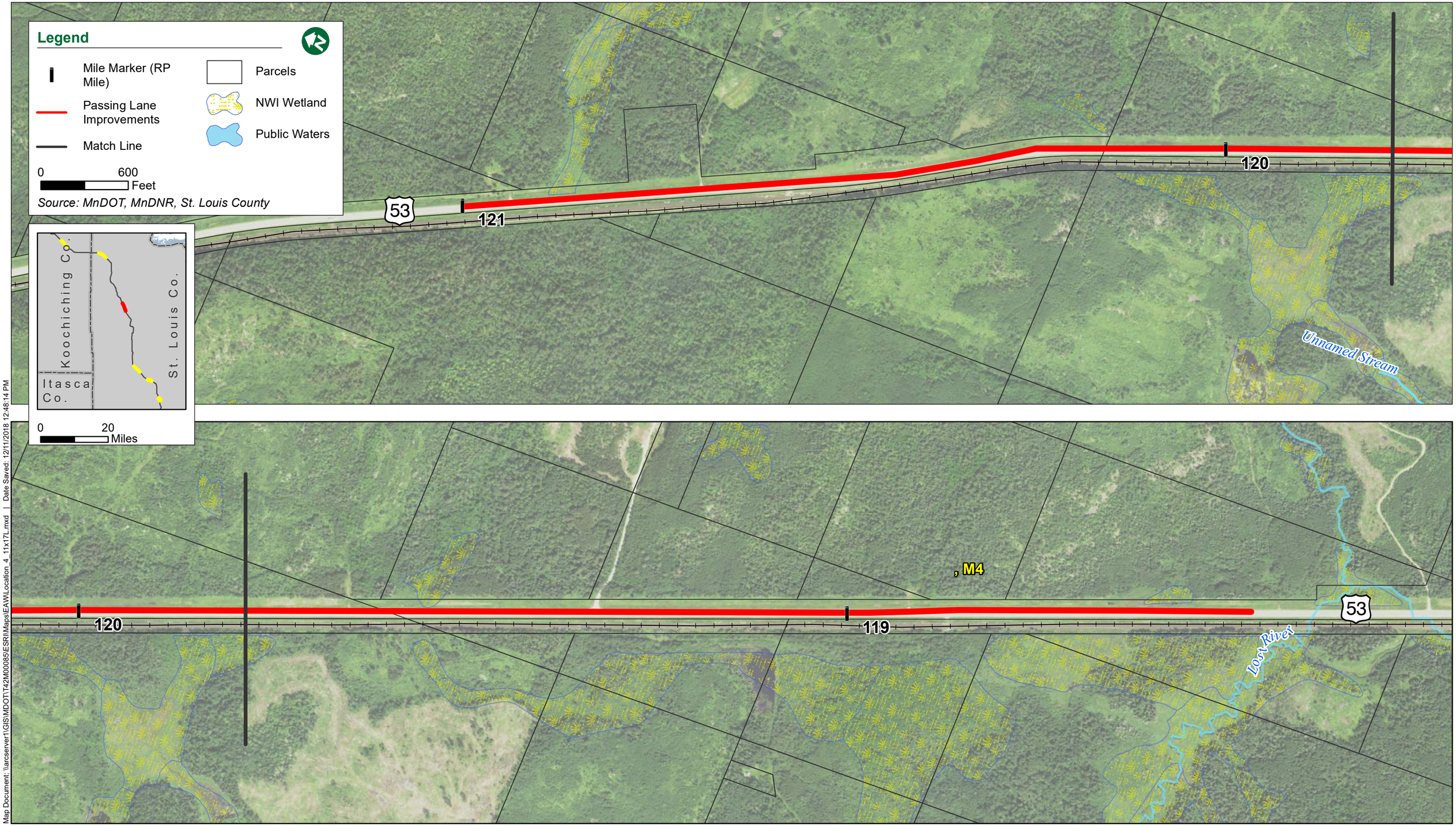
Figure 7:
Location 4 - Passing Lane Segment B

December 2018



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TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

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Figure 8:
Location 5 - Passing Lane Segment C

December 2018

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DEPARTMENT OF TRANSPORTATION

TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

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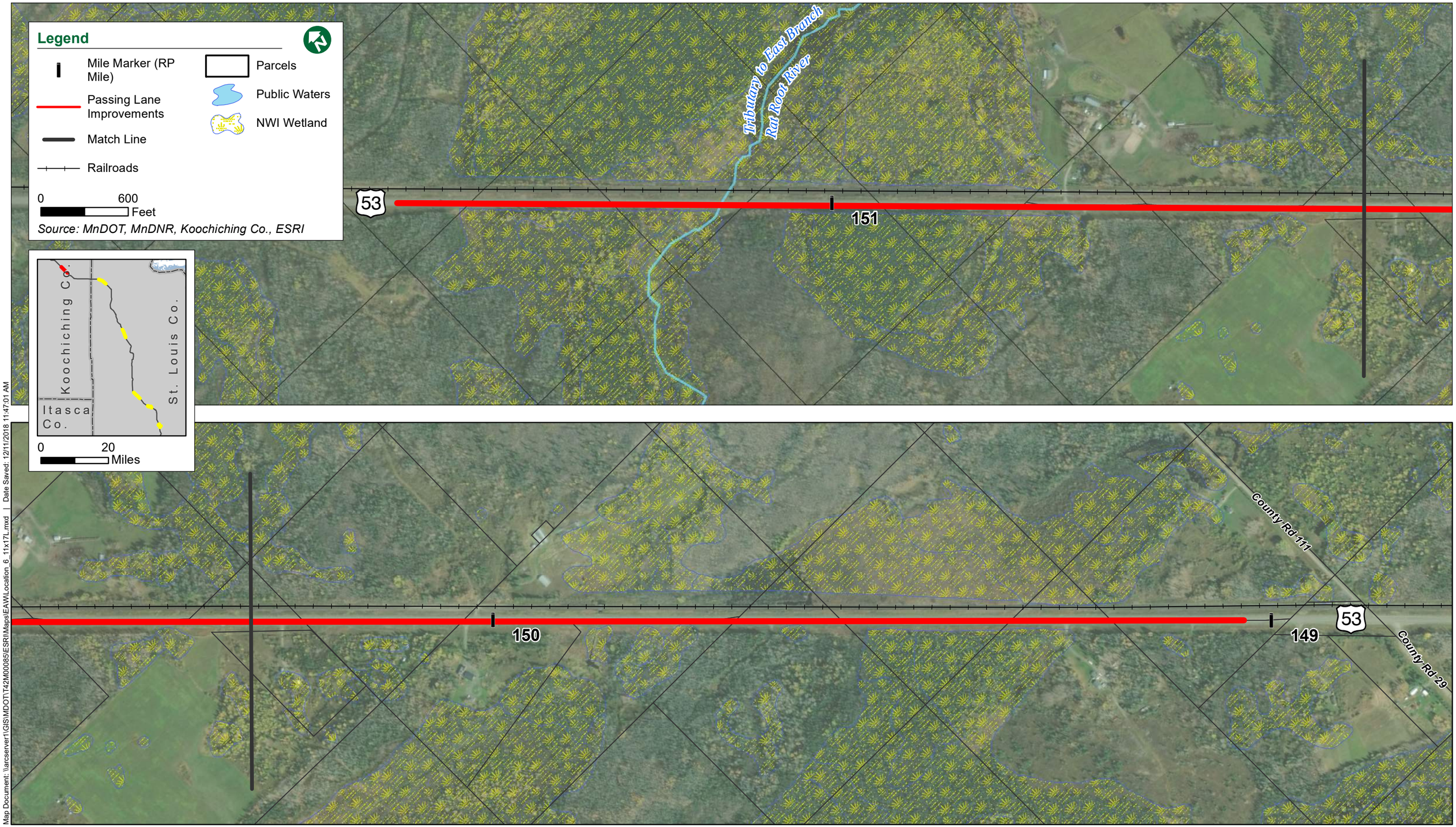
Figure 9:
Location 6 - Passing Lane Segment D

December 2018



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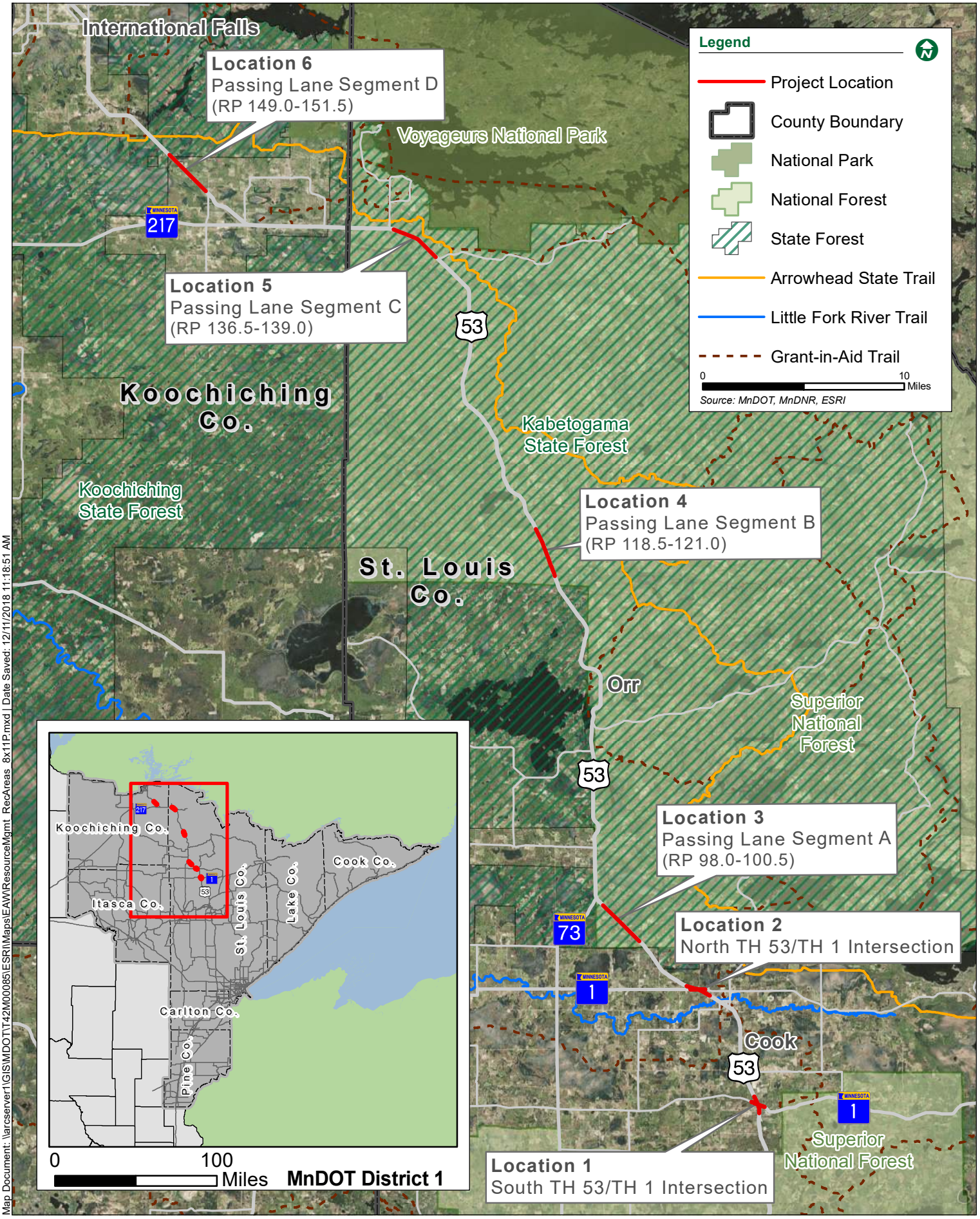

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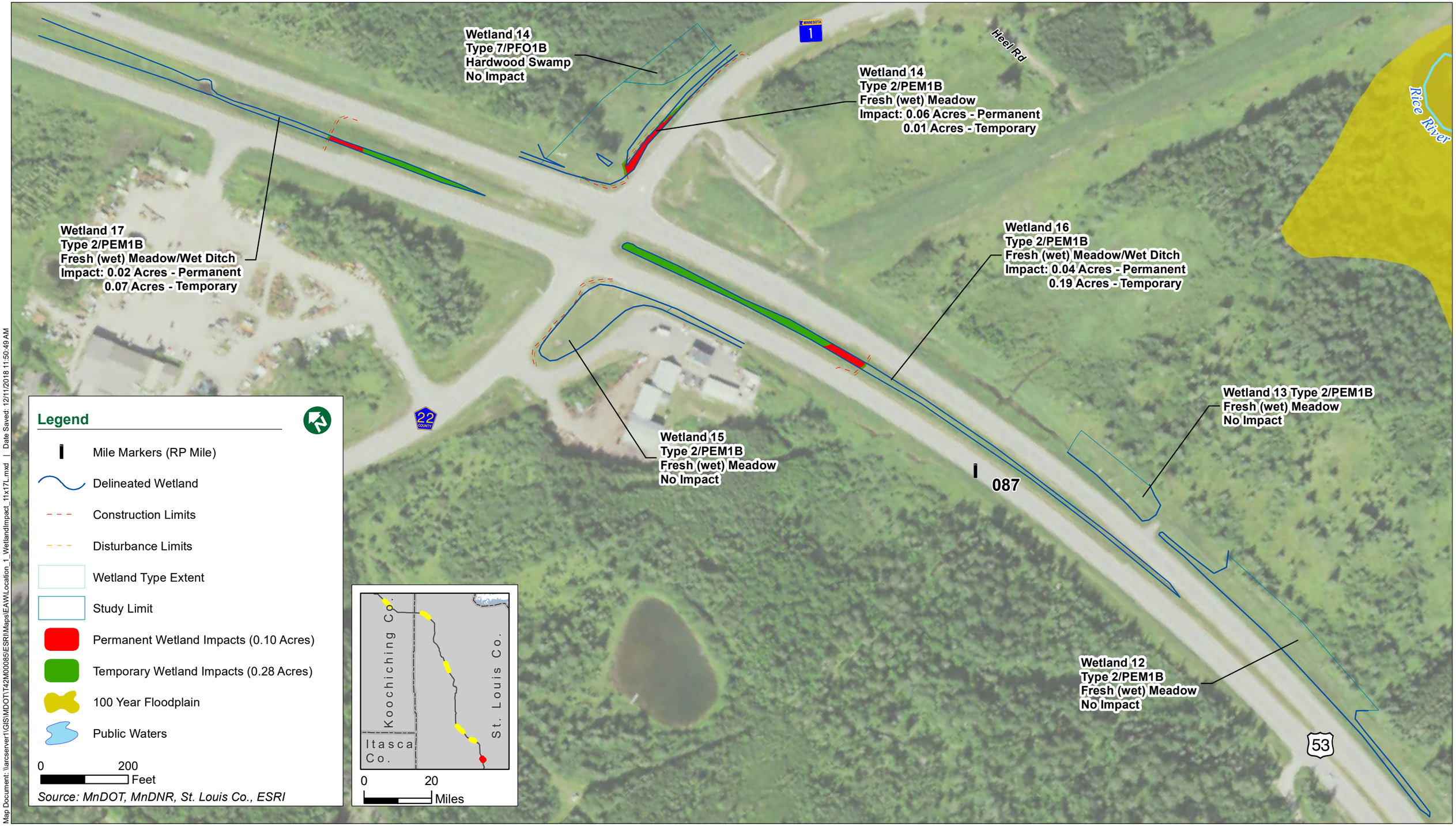
DEPARTMENT OF TRANSPORTATION

TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

Minnesota Department of Transportation

Figure 11: Location 1 - South TH 53/TH 1 Intersection
Wetland Delineation and Impacts

December 2018



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DEPARTMENT OF TRANSPORTATION

TH 53 Intersection and Passing Lane Improvements
Environmental Assessment Worksheet

Minnesota Department of Transportation

Figure 12: Location 2 - North TH 53/TH 1 Intersection
Wetland Delineation and Impacts

December 2018

Wetland 11
Type 2/PEM1B
Fresh (wet) Meadow
Impact: 0.42 Acres - Permanent
0.12 Acres - Temporary

Wetland 9
Type 2/PEM1B
Sedge Meadow
Impact: 0.05 Acres - Permanent
0.08 Acres - Temporary

Wetland 4
Type 2/PEM1B
Fresh (wet) Meadow
Impact: 0.02 Acres - Permanent
0.02 Acres - Temporary

Wetland 1
Type 2/PEM1B
Sedge Meadow
Impact: 35 SF - Permanent
0.01 Acres - Temporary

Wetland 10
Type 6/PSS1B
Shurb-Carr
No Impact

Wetland 2
Type 3/PEM1C
Shallow Marsh/Wet Ditch
No Impact

Wetland 10
Type 2/PEM1B
Fresh (wet) Meadow
Impact: 0.16 Acres - Permanent
0.07 Acres - Temporary

Wetland 3
Type 7/PFO4B
Coniferous Swamp
Impact: 0.04 Acres - Permanent
371 SF - Temporary

Wetland 8
Type 2/PEM1B
Shallow Marsh/Wet Ditch
Impact: 0.09 Acres - Permanent
0.04 Acres - Temporary

Wetland 3
Type 2/PEM1B
Fresh (wet) Meadow
Impact: 0.25 Acres - Permanent
0.05 Acres - Temporary

Wetland 7
Type 3/PEM1C
Shallow Marsh/Wet Ditch
No Impact

Wetland 6
Type 3/PEM1C
Shallow March/Wet Ditch
Impact: 258.36 SF - Permanent
244.70 SF - Temporary

Wetland 5
Type 2/PEM1B
Sedge Meadow
Impact: 0.02 Acres - Permanent
0.03 Acres - Temporary

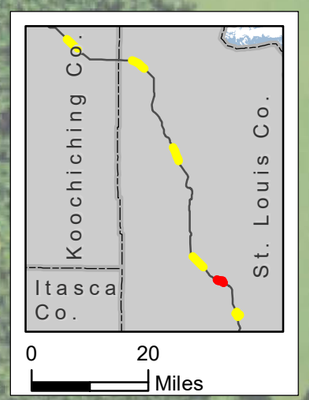
Wood Rd
Twp Rd 7972
Ashawa Rd
COUNTY 937 ROAD
MINNESOTA 1
115 COUNTY
I 236
I 094
US 53

Legend

- Mile Markers (RP Mile)
- Delineated Wetland
- Construction Limits
- Disturbance Limits
- Wetland Type Extent
- Study Limit
- Permanent Wetland Impacts (1.06 Acres)
- Temporary Wetland Impacts (0.44 Acres)

0 200 Feet

Source: MnDOT, MnDNR, St. Louis Co., ESRI



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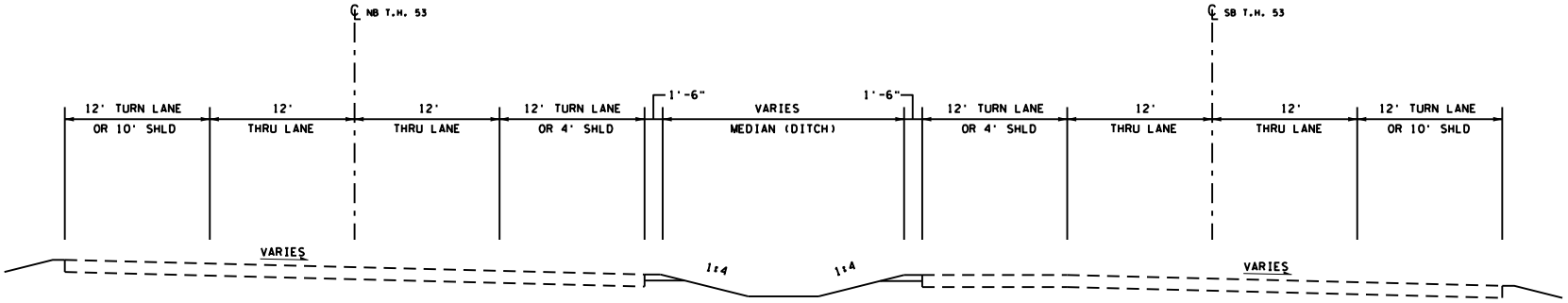
Appendix A: Existing and Proposed Typical Sections

LOCATION 1

EXISTING TYPICAL SECTION - T.H. 53

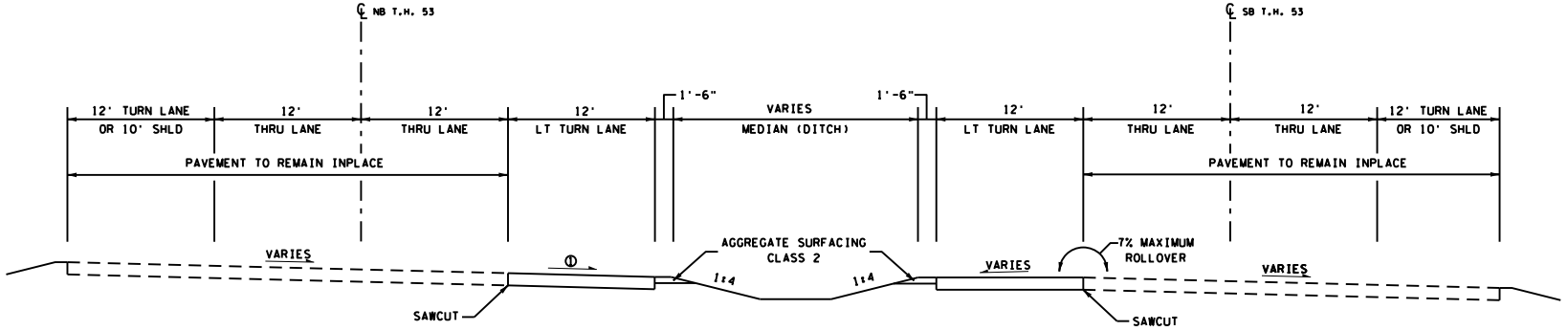
STA 1463+47.16 - 1476+72.05



LOCATION 1

PROPOSED TYPICAL SECTION - T.H. 53

STA 1463+47.16 - 1476+72.05



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BURNSVILLE, MINNESOTA 55337
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Email: Burnsville@bolton-menk.com
www.bolton-menk.com

REV.	BY	DATE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

ENGINEER SIGNATURE 1

ENGINEER

LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED	XXX
DRAWN	XXX
CHECKED	XXX

S.P. 6920-53

TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES

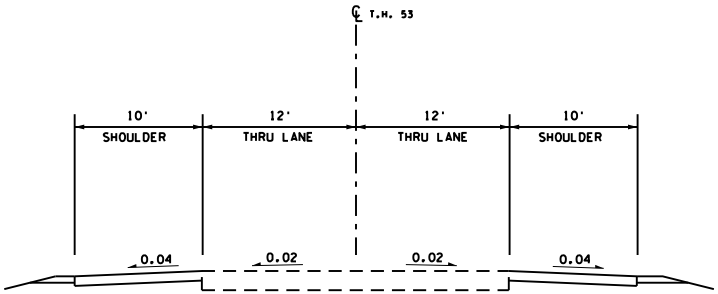
SHEET NAME

SHEET X OF XX

LOCATION 2

EXISTING TYPICAL SECTION - T.H. 53

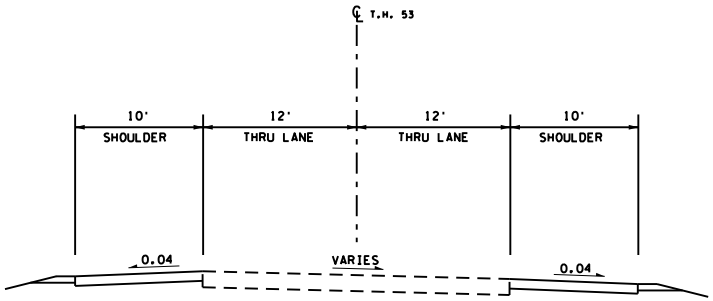
STA 1114+82.54 - 1121+28.85



LOCATION 2

EXISTING TYPICAL SECTION - T.H. 53

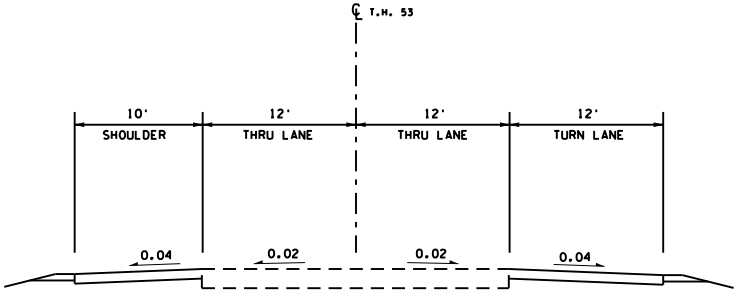
STA 1129+37.37 - 1132+71.55



LOCATION 2

EXISTING TYPICAL SECTION - T.H. 53

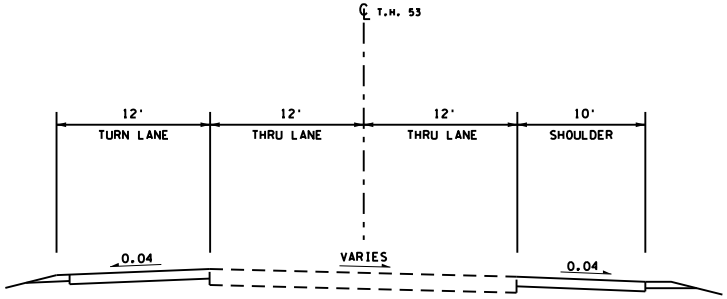
STA 1121+28.85 - 1129+37.37



LOCATION 2

EXISTING TYPICAL SECTION - T.H. 53

STA 1132+71.55 - 1136+46.00



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REV.	BY	DATE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

ENGINEER SIGNATURE 1

ENGINEER

LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED	XXX
DRAWN	XXX
CHECKED	XXX

S.P. 6920-53

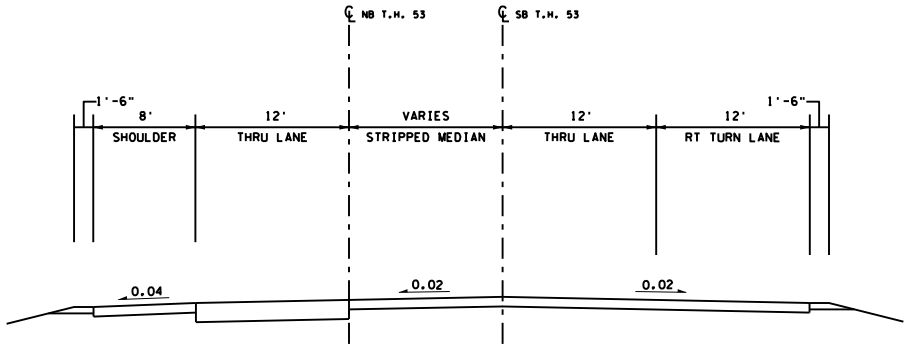
TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES

SHEET NAME

SHEET X OF XX

LOCATION 2
PROPOSED TYPICAL SECTION - T.H. 53

SECTION A-A
STA 1114+82.54 - 1121+28.85



LOCATION 2
PROPOSED TYPICAL SECTION - T.H. 53

SECTION B-B
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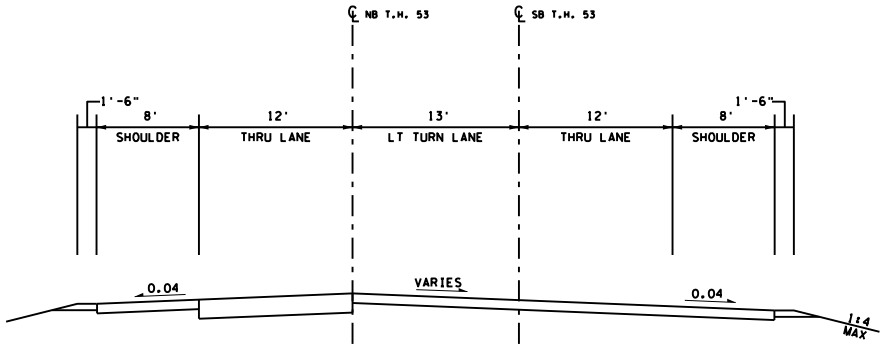

LOCATION 2
PROPOSED TYPICAL SECTION - T.H. 53

SECTION C-C
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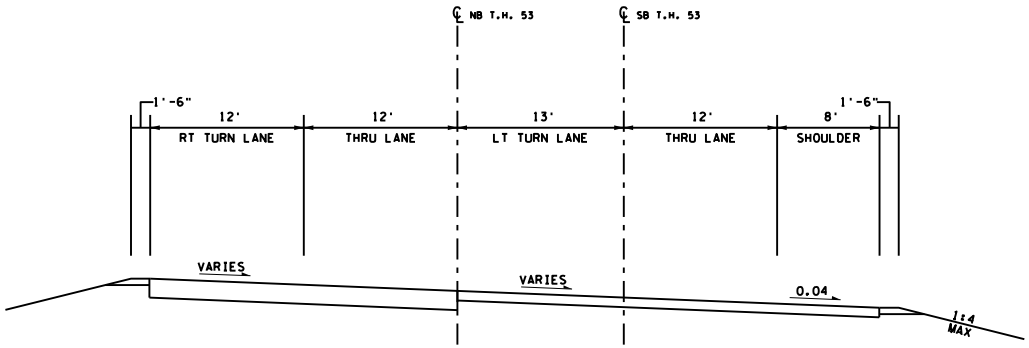

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www.bolton-menk.com

REV.	BY	DATE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

ENGINEER SIGNATURE 1
ENGINEER
LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED XXX
DRAWN XXX
CHECKED XXX

S.P. 6920-53
TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES
SHEET NAME

SHEET X OF XX

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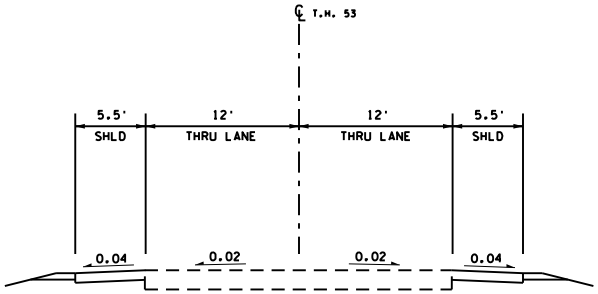
LOCATION 2

EXISTING AND PROPOSED TYPICAL SECTION - T.H. 1*

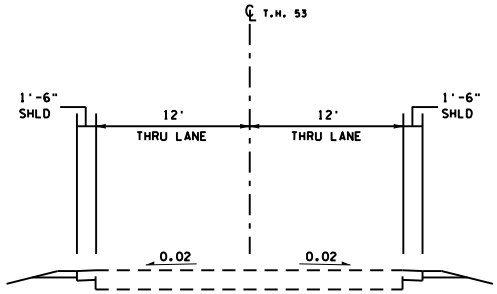
STA 2343+40.5 - 2344+10.88



LOCATION 2

EXISTING AND PROPOSED TYPICAL SECTION - C.R. 937*

STA 31+98.66 - 33+17.54



LOCATION 2

EXISTING AND PROPOSED TYPICAL SECTION - C.R. 115*

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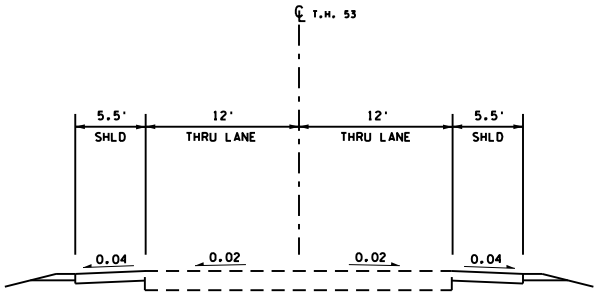

*NOTE
GEOMETRY BETWEEN EXISTING AND PROPOSED SECTIONS
AT T.H. 1, C.R. 937, AND C.R.115
DOES NOT CHANGE

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ENGINEER SIGNATURE 1

ENGINEER

LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED	XXX
DRAWN	XXX
CHECKED	XXX

S.P. 6920-53

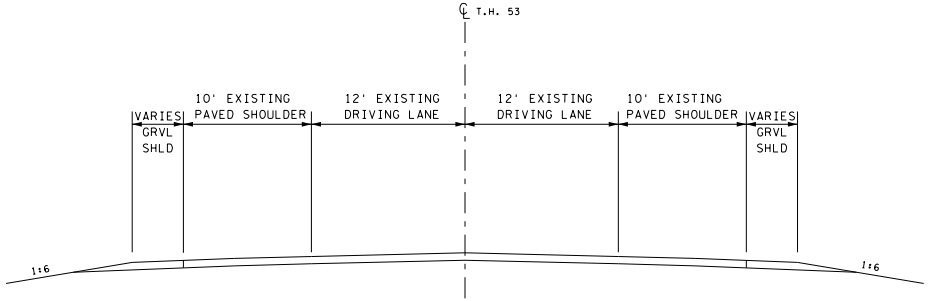
TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES

SHEET NAME

SHEET X OF XX

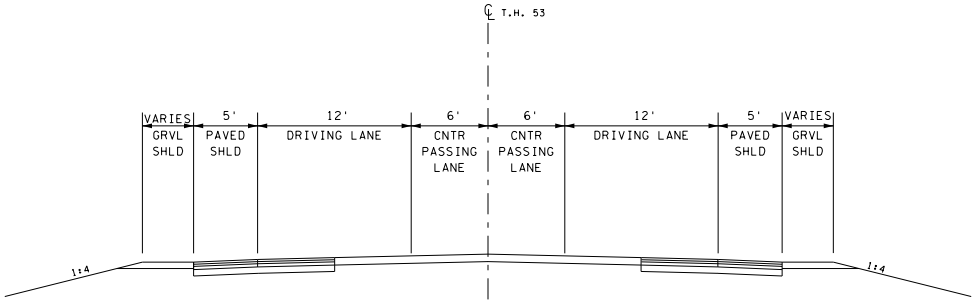
LOCATIONS 3-6
EXISTING TYPICAL SECTION - T.H. 53

R.P. 98+00.000 - 100+00.500
R.P. 118+00.500 - 121+00.000
R.P. 136+00.500 - 139+00.000
R.P. 149+00.000 - 151+00.500



LOCATIONS 3-6
PROPOSED TYPICAL SECTION - T.H. 53

R.P. 98+00.000 - 100+00.500
R.P. 118+00.500 - 121+00.000
R.P. 136+00.500 - 139+00.000
R.P. 149+00.000 - 151+00.500



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ENGINEER SIGNATURE 1

ENGINEER
LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED	XXX
DRAWN	XXX
CHECKED	XXX

S.P. 6920-53
TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES
SHEET NAME

SHEET X OF XX

Appendix B: Environmental Mitigation Commitments

TH 53 Intersection and Passing Lane Improvement Project

Environmental Mitigation Commitments

Topic	Mitigation Commitments	Further Information
Stormwater	Construction Best Management Practices (BMPs) • Siltation fences, bio-rolls, wood-chip cover • Temporary outlet protection • Temporary ponding where appropriate/feasible • Limiting exposed areas where feasible through construction phasing and other measures • Timely placement of permanent cover including topsoil, seed and mulch, and sod or hydro-seeding	To be defined in NPDES Stormwater Pollution Prevention Plan as part of final design . See EAW Item 11.b, page 18.
Stormwater	Project Location 4: • Immediately initiate stabilization of exposed soil areas, as described in item 8.4 of the August 1, 2018 NPDES Construction Stormwater Permit, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the site temporarily or permanently ceases.	NPDES requirement due to Trout Stream (Lost River) which receives drainage from Location 4. See EAW Item 11.b, page 18.
Wetlands	Project Locations 3-6: • Where work extends beyond existing shoulder point of intersection (PI) use 1:4 sideslopes to tie into current 1:6 sideslopes.	To avoid potential wetland resources associated with ditch bottoms. See EAW Item 11.b, page 19.
Wetlands	• Mitigate impacted wetlands consistent with applicable Section 404 federal requirements and Wetland Conservation Act (WCA) state requirements. • Final mitigation requirements to be determined through permitting process. • Wetlands anticipated to require mitigation: 1, 3, 4, 5, 9, 10, 11 14 (see EAW Figure 11 and Figure 12). • Anticipated mitigation at 1:1 ratio at federally and state approved mitigation bank within BWSR Bank Service Area 2.	See EAW Item 11.b, page 19.

Topic	Mitigation Commitments	Further Information
Invasive Species	• Compliance with MnDOT's Standard Specifications for Construction, Section 2572.	See EAW Item 13.c, page 26.
Sensitive Biotic Resources (general)	• Construction plans for Location 5 will label Areas of Environmental Sensitivity • This is based on DNR information that this segment passes through bogs and wooded wetlands (white cedar swamp) that contain rare plant species, including three of special concern species: White Adder's Mouth (*Malaxis monophyllos var. brachypoda*), Lapland Buttercup (*Ranunculus lapponicus*), and Northern Oak Fern (*Gymocarphium robertianum*). The DNR indicates that there are no known locations of these species within MnDOT right-of-way, where the work will take place. • Mitigation to include avoidance and NPDES BMPs as identified in final plans.	Per DNR recommendation (EAW Appendix D). See EAW Item 13.d, page 26.
Northern Long Eared Bats	• No tree removal June 1 through July 31.	DNR reports no known roosting trees or hibernacula within a mile of the project locations. See EAW Item 13.d, page 26.
Construction - Dust	• Minimize the period and extent of areas being exposed or regarded at any one time. • Spray construction areas and haul roads with water, especially during periods of high wind or high levels of construction activity. • Minimize the use of vehicles on unpaved surfaces. • Cover or spray with water material piles and truckloads.	See EAW Item 16.c, page 28.
Construction - Noise	• Contractor will be required to comply with applicable local noise ordinances. • Construction equipment will be required to have factory-installed mufflers or their equivalents in good working order during the life of the construction contract.	See EAW Item 17.a, page 29.

Appendix C: Soils Information

Location 1 Soils Information (South Intersection)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
B4A	Indus-Dora, depressional, complex, 0 to 2 percent slopes	18.6%	Not prime farmland	clayey glaciolacustrine deposits	D
B5B	Alango-Taylor-Woodslake, depressional, complex, 0 to 6 percent slopes	65.1%	Not prime farmland	clayey glaciolacustrine deposits	D
B9A	Greaney and Dora soils, 0 to 1 percent slopes, frequently flooded	0.3%	Not prime farmland	clayey alluvium	C/D
B11B	Taylor-Taylor, sandy substratum complex, 2 to 6 percent slopes	4.7%	Farmland of statewide importance	clayey glaciolacustrine sediments	D
B46A	Dora mucky peat, Taylor catena, 0 to 1 percent slopes	5.4%	Not prime farmland	herbaceous organic material over clayey glaciolacustrine deposits	D
F3D	Eveleth-Eagelsnest-Conic complex, bouldery, 6 to 18 percent slopes, very rocky	5.6%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
F37B	Foglake-Babbitt, bouldery, complex, 0 to 4 percent slopes	0.3%	Not prime farmland	glaciolacustrine deposits	C/D
Totals for Area of Interest		**100%**			

Location 2 Soils Information (North Intersection)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
B5B	Alango-Taylor-Woodslake, depressional, complex, 0 to 6 percent slopes	100%	Not prime farmland	clayey glaciolacustrine deposits	D
Totals for Area of Interest		**100%**			

Location 3 Soils Information (Passing Lane Segment A)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
B2A	Indus-Woodslake, depressional, complex, 0 to 1 percent slopes	1.1%	Not prime farmland	clayey glaciolacustrine deposits	D
B4A	Indus-Dora, depressional, complex, 0 to 2 percent slopes	15.4%	Not prime farmland	clayey glaciolacustrine deposits	D
B5B	Alango-Taylor-Woodslake, depressional, complex, 0 to 6 percent slopes	36.6%	Not prime farmland	clayey glaciolacustrine deposits	D
B10B	Rollins sandy loam, 2 to 8 percent slopes	11.9%	Not prime farmland	loamy material over gravelly outwash	A
B10D	Rollins sandy loam, 8 to 18 percent slopes	4.0%	Not prime farmland	loamy material over gravelly outwash	A
B82A	Greenwood-Greenwood, ponded, complex, 0 to 1 percent slopes	2.8%	Not prime farmland	herbaceous organic material	A/D

F2B	Eaglesnest-Wahlsten complex, 2 to 8 percent slopes, bouldery	6.7%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
F3D	Eveleth-Eagelsnest-Conic complex, bouldery, 6 to 18 percent slopes, very rocky	7.6%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
F6B	Soudan-Eaglesnest-Babbitt complex, 1 to 8 percent slopes, bouldery	5.1%	Not prime farmland	loamy drift over dense gravelly lodgment till	B
F7B	Biwabik-Graycalm complex, 1 to 8 percent slopes	0.2%	Not prime farmland	gravelly outwash	A
F11B	Eaglesnest stony loam, 2 to 8 percent slopes, bouldery	7.4%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
F14D	Eveleth stony loam, 8 to 18 percent slopes, bouldery	0.6%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
GP	Pits, gravel-Udipsamments complex	0.6%	Not prime farmland	Sandy and gravelly outwash	
Totals for Area of Interest		**100%**			

Location 4 Soils Information (Passing Lane Segment B)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
1020A	Bowstring and Fluvaquents, loamy, 0 to 2 percent slopes, frequently flooded	4.3%	Not prime farmland	alluvium	B/D
B275A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	7.8%	Not prime farmland	herbaceous organic material	A/D
F3D	Eveleth-Eagelsnest-Conic complex, bouldery, 6 to 18 percent slopes, very rocky	6.8%	Not prime farmland	loamy drift over dense gravelly lodgment till	C
F5B	Babbitt, bouldery-Wahlsten, bouldery-Aquepts, rubbly, complex, 0 to 8 percent slopes	4.1%	Not prime farmland	loamy drift over dense gravelly lodgment till	C/D
F36D	Conic, bouldery-Insula, bouldery-Rock outcrop complex, 8 to 25 percent slopes	2.8%	Not prime farmland	loamy drift over bedrock	D
F40D	Rollins cobbly sandy loam, 8 to 18 percent slopes	5.7%	Not prime farmland	loamy material over gravelly outwash	A
F168A	Foglake-Hassman, depressional, complex, MLRA 93A, 0 to 2 percent slopes	0.6%	Not prime farmland	glaciolacustrine deposits	C/D
F172B	Westoo-Barber-Vasso complex, MLRA 93A, 0 to 6 percent slopes	21.4%	Not prime farmland	eolian deposits	A/D
F189B	Suomi-Ashlake complex, 1 to 8 percent slopes	2.1%	All areas are prime farmland	till	C/D
F190B	Ashlake-Effie complex, 0 to 4 percent slopes	19.8%	Farmland of statewide importance	till	C/D
F200A	Northwood-Hassman-Cathro soils, 0 to 1 percent slopes	3.2%	Not prime farmland	herbaceous organic material over till	C/D
F201B	Rollins-Biwabik-Friendship complex, 0 to 8 percent slopes	2.9%	Not prime farmland	loamy drift over gravelly outwash	A

F202B	Ricelake-Cutaway complex, 1 to 4 percent slopes	4.0%	Farmland of statewide importance		C/D
F205D	Rollins-Biwabik complex, suomi catena, 8 to 18 percent slopes	0.2%	Not prime farmland	loamy material over gravelly outwash	A
F208B	Babbitt, bouldery-Wahlsten, bouldery-Canthook complex, 0 to 8 percent slopes	0.7%	Not prime farmland	loamy drift over dense gravelly lodgment till	C/D
F209D	Conic, bouldery-Rock outcrop-Eaglesnest, bouldery, complex, 0 to 18 percent slopes	2.9%	Not prime farmland	loamy drift over dense gravelly lodgment till over bedrock	D
F211B	Durkeelake-Canthook-Longsiding complex, 0 to 6 percent slopes	1.3%	Not prime farmland	clayey glaciolacustrine deposits	C/D
F212A	Canthook-Bootleg-Foglake complex, 0 to 3 percent slopes	7.8%	Not prime farmland	clayey glaciolacustrine deposits	C/D
F214A	Aquepts, rubbly-Foglake-Hassman, depressional, complex, 0 to 2 percent slopes	1.6%	Not prime farmland	glaciolacustrine deposits	C/D
Totals for Area of Interest		**100%**			

Location 5 Soils Information (Passing Lane Segment C)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
2srrt	Bowstring and Fluvaquents soils, 0 to 2 percent slopes, frequently flooded	1.3%	Not prime farmland	herbaceous organic material over stratified loamy herbaceous organic material over loamy alluvium	A/D
B275A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	31.1%	Not prime farmland	herbaceous organic material	A/D
F189B	Suomi-Ashlake complex, 1 to 8 percent slopes	34.8%	All areas are prime farmland	till	C/D
F190B	Ashlake-Effie complex, 0 to 4 percent slopes	31.6%	Farmland of statewide importance	till	C/D
F194D	Suomi loam, 8 to 18 percent slopes	1.2%	Not prime farmland	till	D
Totals for Area of Interest		**100%**			

Location 6 Soils Information (Passing Lane Segment D)

Map Unit Symbol	Map Unit Name	Percent of AOI	Farmland Rating	Parent Material	Hydro Soil Group
B50A	Ratroot-Dora complex, 0 to 1 percent slopes	6%	Not prime farmland	clayey till	C/D
B55A	Kooch-Kab-Ratroot complex, 0 to 4 percent slopes	6.5%	Farmland of statewide importance	clayey till	C/D
B146A	Kab-Ratroot complex, 0 to 2 percent slopes	15.5%	Not prime farmland	clayey till	C/D
B151A	Kab-Kooch complex, 0 to 4 percent slopes	50.5%	Farmland of statewide importance	clayey till	C/D
B262A	Dora and Terric Haplohemist soils, kab catena, 0 to 1 percent slopes	12.5%	Not prime farmland	herbaceous organic material over clayey glaciolacustrine deposits over clayey till	D
B275A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	9%	Not prime farmland	herbaceous organic material	A/D
Totals for Area of Interest		**100%**			

Appendix D: Location 2 Alternatives Eliminated

Location 2, Alternative 1: Single Relocated Intersection

Location 2, Alternative 2: Wide Separation T Intersections

Appendix E: Environmental Review Correspondence

Peter Langworthy

From: Canino, Mary (DOT)
Sent: Thursday, September 13, 2018 2:44 PM
To: Alcott, Jason (DOT)
Cc: Kerfeld, Douglas (DOT); Erickson, Daniel J (DOT); Boben, Carolyn (DOT)
Subject: TH 53 SP 6920-53 RCI and Passing Lanes ENM – CMMT Response

ENM Due Date: 10/3/2018
Letting Date: 4/26/2019
T number: T1834
Report Writer: Jason Alcott
Project Manager: Doug Kerfeld
Project Designer: Daniel Erickson

TH 53 SP 6920-53 RCI and Passing Lanes ENM – CMMT Response

The Contaminated Materials Management Team (CMMT) reviewed the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Agriculture (MDA) databases to check for known contaminated sites in the project area. The databases searched included: leaking underground storage tank facilities, landfills, salvage yards, voluntary investigation and cleanup (VIC) sites, Superfund sites and dump sites. A review of these MPCA files is a component of a Phase I Environmental Site Assessment (Phase I ESA). A complete Phase I ESA includes at least two other components: research on historic land use, and site reconnaissance. It should be noted that the MPCA database files are continually being updated. Although this information is the most up-to-date available, some of the information may be incomplete or inaccurate. There is also a possibility that undiscovered contaminated and/or regulated materials exist in the project area.

Based on the database review, one closed unpermitted dump site is located in the vicinity of Reference Post 136.6 within approximately 500 feet of the project area.

Given the nature and location of the project area, and based on the HPDP threshold criteria as summarized below, this project has a low risk of impacting potentially contaminated sites. Therefore, no additional evaluation of the project area for potential contamination is necessary:

1. The project involves acquisition of right-of-way.

2. Project excavation and grading will be moderate for intersection and lane construction. However, because the work is in a rural, minimally developed area, this decreases the chances of encountering contaminants that may have originated from an off-site source and migrated into the right of way.

3. The project is in a rural, minimally developed area. This decreases the chances of encountering contaminants that may have originated from an off-site source and migrated into the right of way.

4. The project requires no groundwater dewatering.

No additional evaluation is necessary at this time with respect to the currently proposed construction activities. This response does **not** provide approval for any acquisition activities. Those activities require separate review and approval under the EDD process.

If new information obtained during project development or construction indicates a contaminated site may be impacted by the project, the property will be evaluated, and soil and groundwater testing completed, as appropriate. If necessary, a plan will be developed for properly handling and treating contaminated soil and/or groundwater during construction in accordance with all applicable state and federal requirements.

Based on our review of the Early Notification Memo and subsequent additional evaluations noted above and MnDOT's commitment to implementation of any necessary management of contaminated materials during construction, the project will not have a high risk of causing direct or indirect impacts to human health or sensitive environmental resources due to encountering contaminated materials.

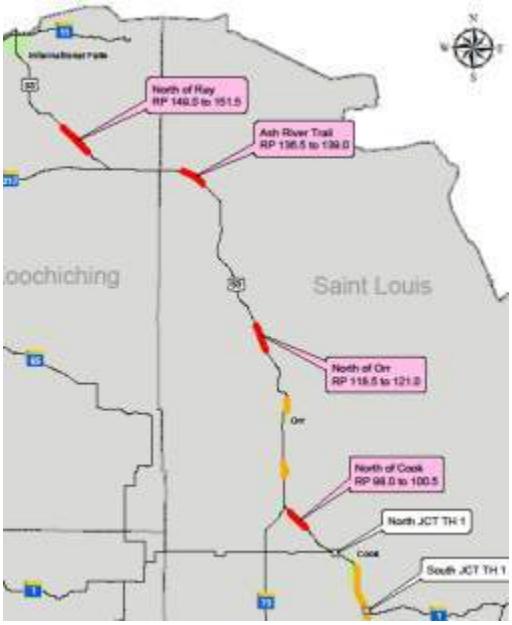
Mary Canino, PG
Consultant for Office of Environmental Stewardship
Minnesota Department of Transportation
395 John Ireland Blvd
St. Paul, MN 55155
Office: 651-366-4293 (Mon &Thur)
Cell: 612-599-5234
mary.canino@state.mn.us

Peter Langworthy

From: Leete, Peter (DOT)
Sent: Friday, November 16, 2018 4:21 PM
To: Alcott, Jason (DOT)
Cc: Meyer, Matthew (DOT); Straumanis, Sarma (DOT); Smith, Christopher E (DOT); Joyal, Lisa (DNR); Orne, Benjamin G MVP; Coyle, Margi (Anne) (DNR); Peterson, Kevin E (DNR); Crozier, Gaea (DNR); Boland, Kim (DNR); Reed, Rian H (DNR)
Subject: DNR Comments on MnDOT Early Notification Memo, TH53 passing lanes and intersection work (SP6920-53) St Louis and Kooch Co.
Attachments: 8_29_18, 6920-53, ENM.PDF; DNRbasemap.pdf; AES.PDF

Jason,

This email is the DNR response for your project records. I have not sent this Early Notification Memo (ENM) out for full DNR review. The following comments are based on information provided in the submitted documents regarding the proposed passing lane construction on 4 segments of TH53 between Cook and International Falls and reconstruction of the two TH53 –TH1 Junctions.



Please incorporate the following comments into final designs and special provisions as they are developed:

1. For MnDOT planning purposes, attached to this email is a map of the project area (DNRbasemap.pdf) showing nearby locations of DNR areas concern (if they exist), such as Public Waters (in blue), waterbodies designated as infested with aquatic invasive species (AIS), snowmobile Trails (in pink), and various green shaded polygons for Sites of Biodiversity Significance. This map may be shared or included in project documentation, as all information is from publically available data layers. Most of this information is also available on the MnDOT georilla website (http://georilla/metrogis/#) in the natural resources catalog (DNR ENM).

   The Natural Heritage Information System (NHIS) database has been reviewed, though in order to prevent the inadvertent release of a rare features location, those details are not shown on the map. Comments on potential impacts to rare features listed in the NHIS comments are below. If you have questions regarding proposed work near any of the data shown, please give me a call.

2. The DNR Public Waters that are in or near the project area are:
    - Lost River (Bridge 95515) and an Unnamed Stream (culvert crossing) on the passing lane segment north of Cook. These also a designated Trout Streams
    - Unnamed Stream (bridge 8207) on the Ash River Trail Passing lane segment
    - Unnamed Stream (bridge 8209) on the passing lane segment north of Ray

    Should plans not avoid impacting DNR Public Waters at any of the above locations, please contact me as further review will be required. Resetting aprons or replacing 'in kind' (no change to length, diameter, invert elevations) typically will not require field review, though be aware the project may need to be reviewed/authorized under GP2004-0001 and that the design and timing of the work will need to follow DNR standard requirements, including use of natural net erosion control blanket, use of native vegetation, crossings designed for fish passage requirements, and limits to work in the water (Work Exclusion dates) for allowing undisturbed fish migration and spawning. No work in the water will be allowed from April 1 through June30 or for the trout streams September 15 through June 30. While we may revise these dates for a particular project, there may still be limitations on the types of work during this time. Also, Regardless of potential impact, DNR Public Waters should be identified as an 'Area of Environmental Sensitivity' on plans. See the attached AES best practices guidance.

    Please be aware that the MPCA NPDES general permit for authorization to discharge stormwater associated with construction activities (permit MN R10001) recognizes the DNR "work in water restrictions" during specified fish migration and spawning time frames for areas adjacent to water. This applies to all Public Waters locations regardless of the need for a Public Waters work permit. During the restriction period, all exposed soil areas that are within 200 feet of the water's edge and drain to these waters, must have erosion prevention stabilization activities initiated immediately after soil disturbing activity has ceased (and be completed within 24 hours).

3. It is unknown what repairs may be proposed to any culverts. A general comment on repairs that may utilize Cured In Place Plastic liners (CIPP) is that installation methods may temporarily alter the chemical or thermal properties in the receiving water during the installation process, curing process, or initial flush. These by-products of installation have potential for adverse impacts to receiving waters. In extreme cases, impacts may result in a localized fish kill. To help assure suitable containment or treatment prior to discharge to Public Waters, Special Provisions in the construction specifications should be written to prevent hot water precipitate or chemical containing precipitate (e.g. styrene or cement waste) from discharging into receiving waters.

4. Please remind contractors that a separate water use permit is required if the projects construction will require the withdrawal of more than 10,000 gallons of water per day or 1 million gallons per year from surface water or ground water. GP1997-0005 (temporary water appropriations) covers a variety of activities associated with road construction and should be applied of if applicable. An individual appropriations permit may be required for projects lasting longer than one year or exceeding 50 million gallons. Information is located at: http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/permits.html

5. The Minnesota Natural Heritage Information System (NHIS) has been queried to determine if any rare plant or animal species, native plant communities, or other significant natural features are known to occur within an approximate one-mile radius of the project area. There were rare features identified in this query. In order to prevent the inadvertent release of the location of specific listed or rare species contained in the NHIS, I have not identified the species or their location on the attached 'DNRbasemap.pdf'. If these details are needed for documentation, please contact me. Please note that the following rare features were identified in the query and *may* be impacted by the proposed project. Suggested avoidance and/or protection measures are also identified:

    a. The Ash River Trail passing lane segment is through bogs and wooded wetlands (white cedar swamp) that contain rare plant species, including three special concern species: White Adder's Mouth (*Malaxis monophyllos var. brachypoda)*, Lapland Buttercup (*Ranunculus lapponicus*), and Northern Oak Fern

(Gymnocarpium robertianum). There are no known locations within the MnDOT right of way, though the plant communities of Tamarac Swamps and White Cedar Swamps are vulnerable to changes in water level regimes particularly within the upper foot of the peat layer. **Altering surficial flow with ditch work or changes to culvert elevations should be avoided. Should there be such work proposed, please contact me as further review and guidance may be required.**

These areas should be identified as 'Area of Environmental Sensitivity' on plans. See the attached AES best practices for guidance on minimizing soil disturbance, incidental herbicide exposure, hydrologic alterations, tree disturbance, competition from non-native, sod-forming grasses, or introduction of weed seeds, that can all lead to degradation of these sites.

b. It is unknown how much tree clearing will be required for this project. The northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened and state-listed as special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Pup rearing is during June, July, and early August. Activities that may impact this species include, but are not limited to, any disturbance to hibernacula and destruction/degradation of habitat (including tree removal).

The U.S. Fish and Wildlife Service (USFWS) has published a final 4(d) rule that identifies prohibited take. To determine whether you need to contact the USFWS, please refer to the USFWS Key to the Northern Long-Eared Bat 4(d) Rule (see links below). Please note that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

Links: USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Non-Federal Activities
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEB.html
USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects.html
USFWS Northern Long-eared Bat Website
http://www.fws.gov/midwest/endangered/mammals/nleb/index.html
USFWS Northern Long-eared Bat Fact Sheet
http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

Please contact Chris Smith (MnDOT Wildlife Ecologist) at 651-366-3605 or christopher.e.smith@state.mn.us in regards to USFWS protection measures for the northern long-eared bat.

The Natural Heritage Information System (NHIS) is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. If information becomes available indicating additional listed species or other rare features, further review may be necessary.

This ENM has not been circulated to DNR field staff for comment. I will let you know if any additional comments on design requirements are returned to me due to this email.

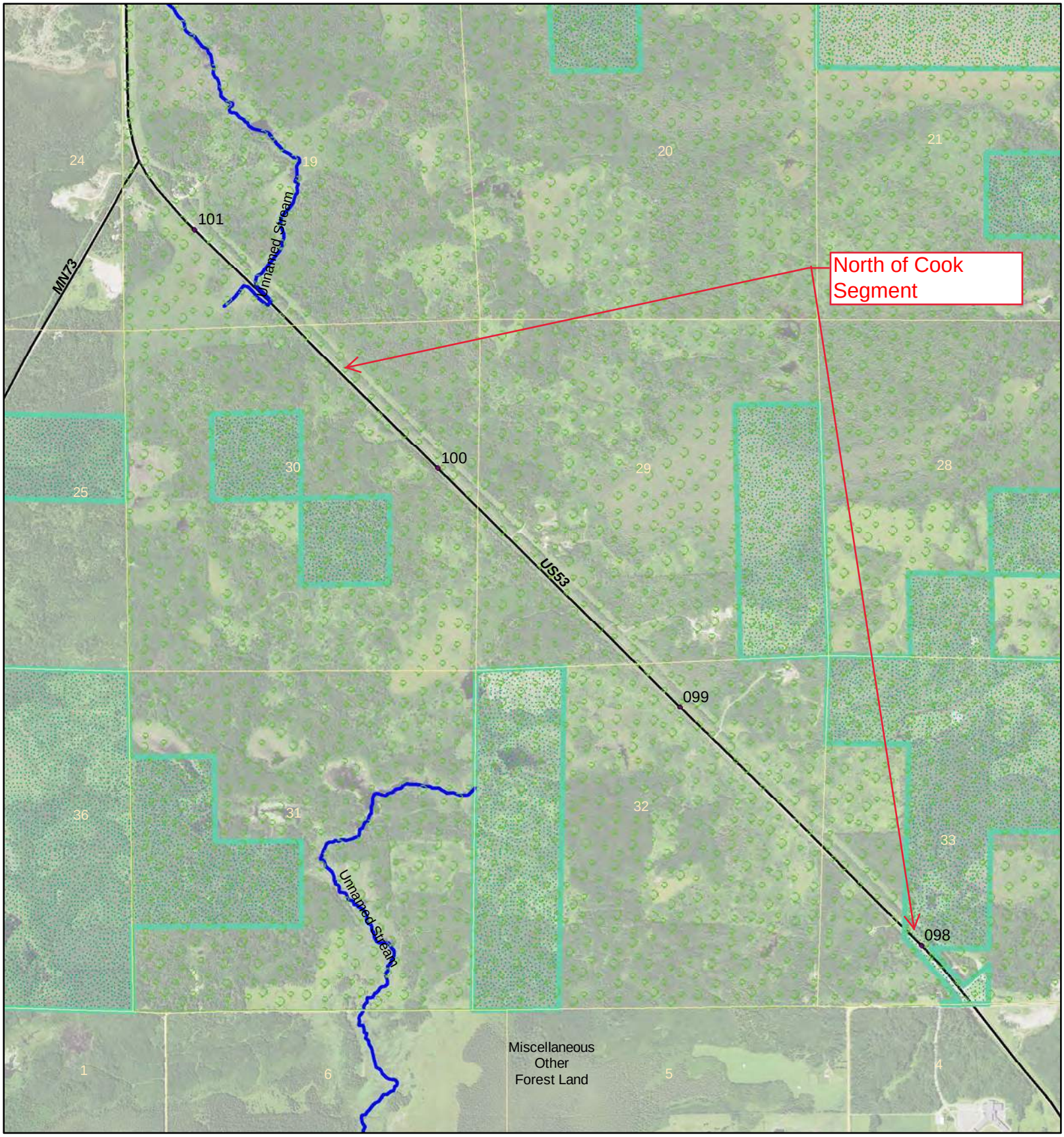
DNR folks, if I've missed anything, or have any suggestions for MnDOT to consider, please respond ASAP to Jason, and myself.

Peter Leete
Transportation Hydrologist (DNR-MnDOT Liaison) | Division of Ecological & Water Resources

Minnesota Department of Natural Resources

Office location: MnDOT Office of Environmental Stewardship
395 John Ireland Blvd., MS 620
St. Paul, MN 55155
Phone: 651-366-3634
Email: peter.leete@state.mn.us

DEPARTMENT OF NATURAL RESOURCES



0 0.25 0.5 1 Miles

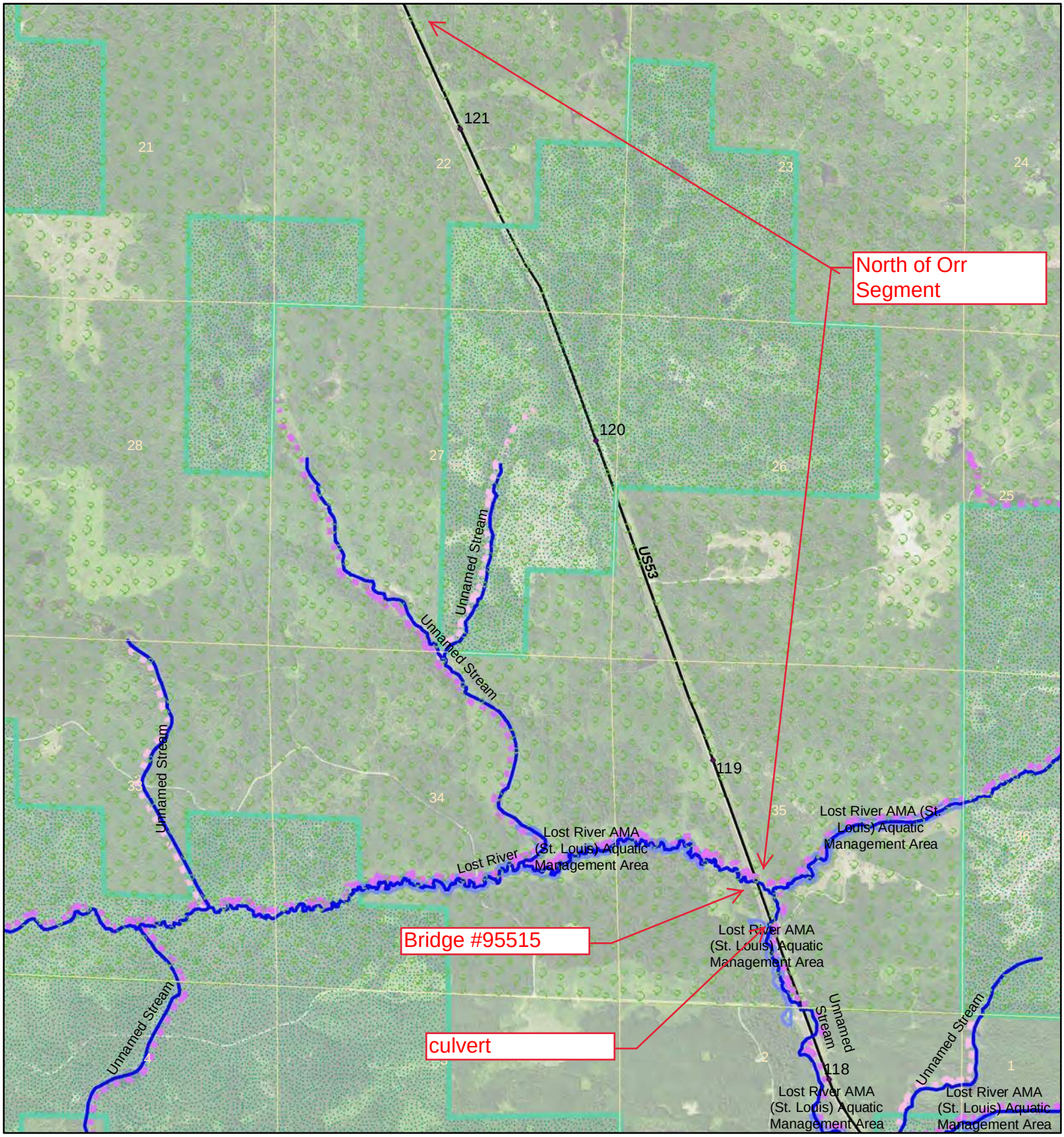
N

TH53 passing lane project (RP98.0 - 100.5) (SP6920-53)

- Superior National Forest
- Public Water Watercourse
- State Forest Land

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 10/23/2018



0 0.25 0.5 1 Miles

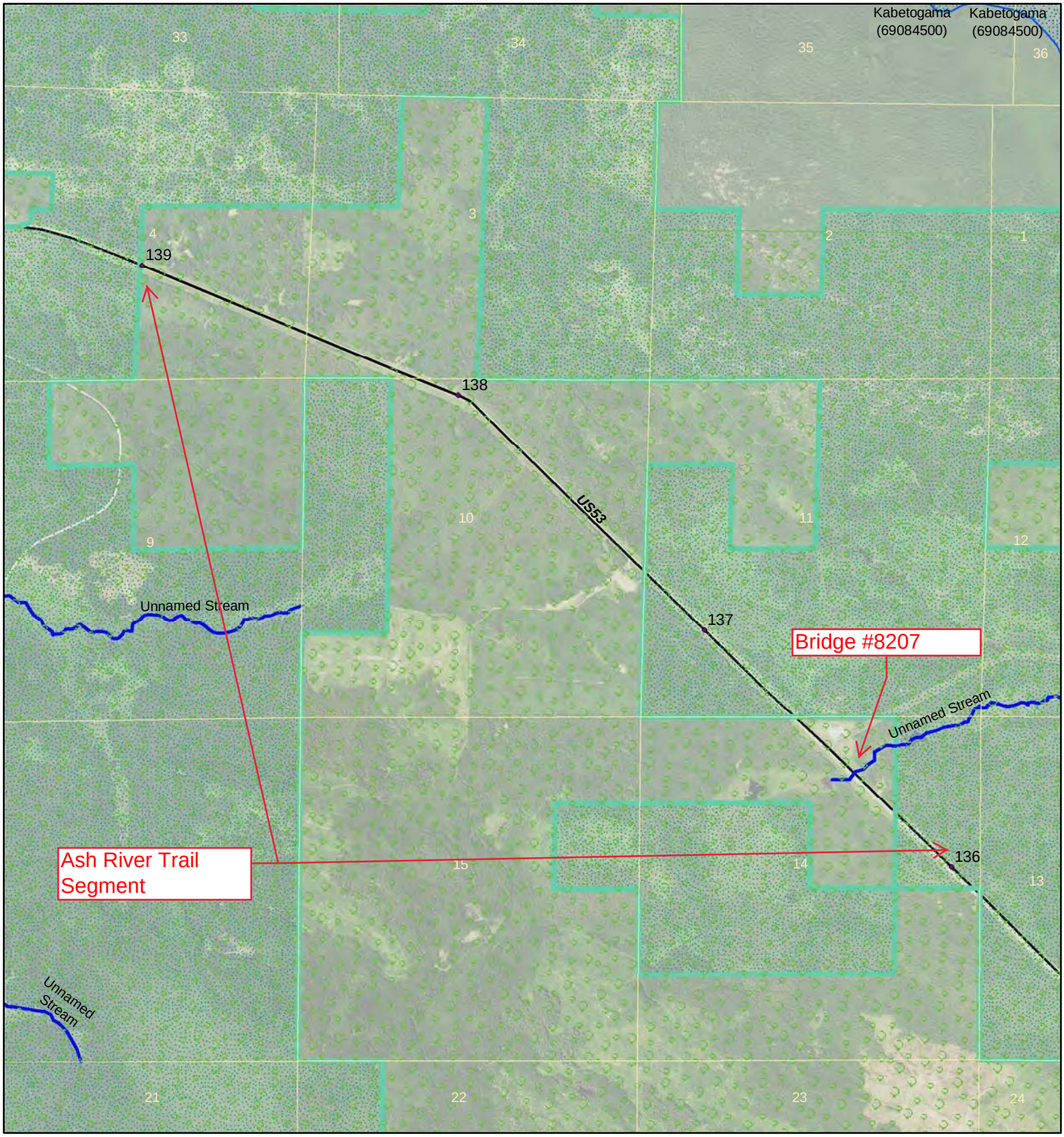
N

TH53 passing lane project (RP118.5-121.0) (SP6920-53)

- Superior National Forest
- Public Water Watercourse
- Designated Trout Stream
- Protected Tributary to Designated Trout Stream
- Aquatic Management Area - AMA
- State Forest Land

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 10/23/2018



0 0.25 0.5 1 Miles

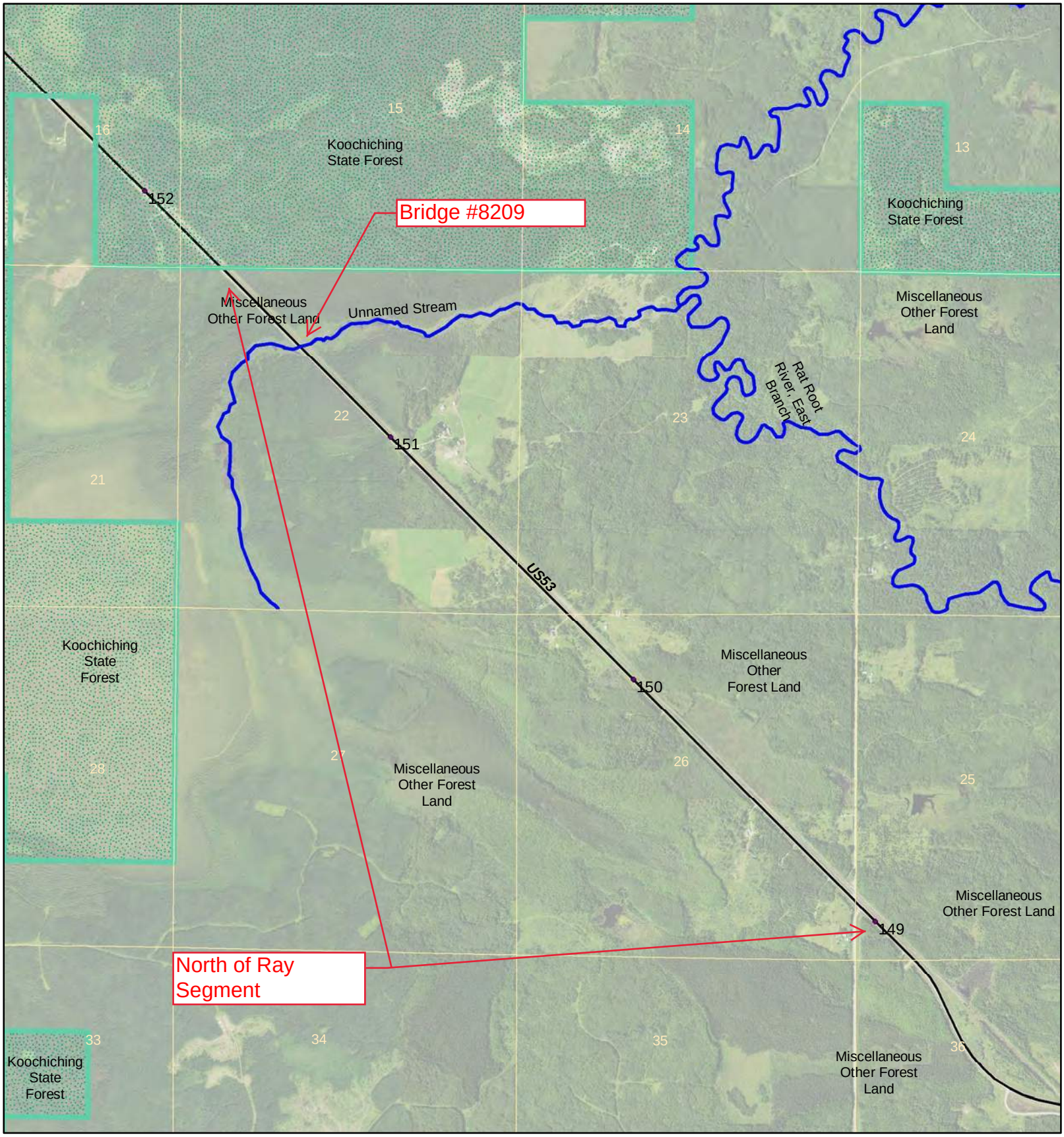
N

TH53 passing lane project (RP136.5 - 139.0) (SP6920-53)

- Superior National Forest
- Public Water Watercourse
- Public Waters Basins
- State Forest Land

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 10/23/2018



0 0.25 0.5 1 Miles

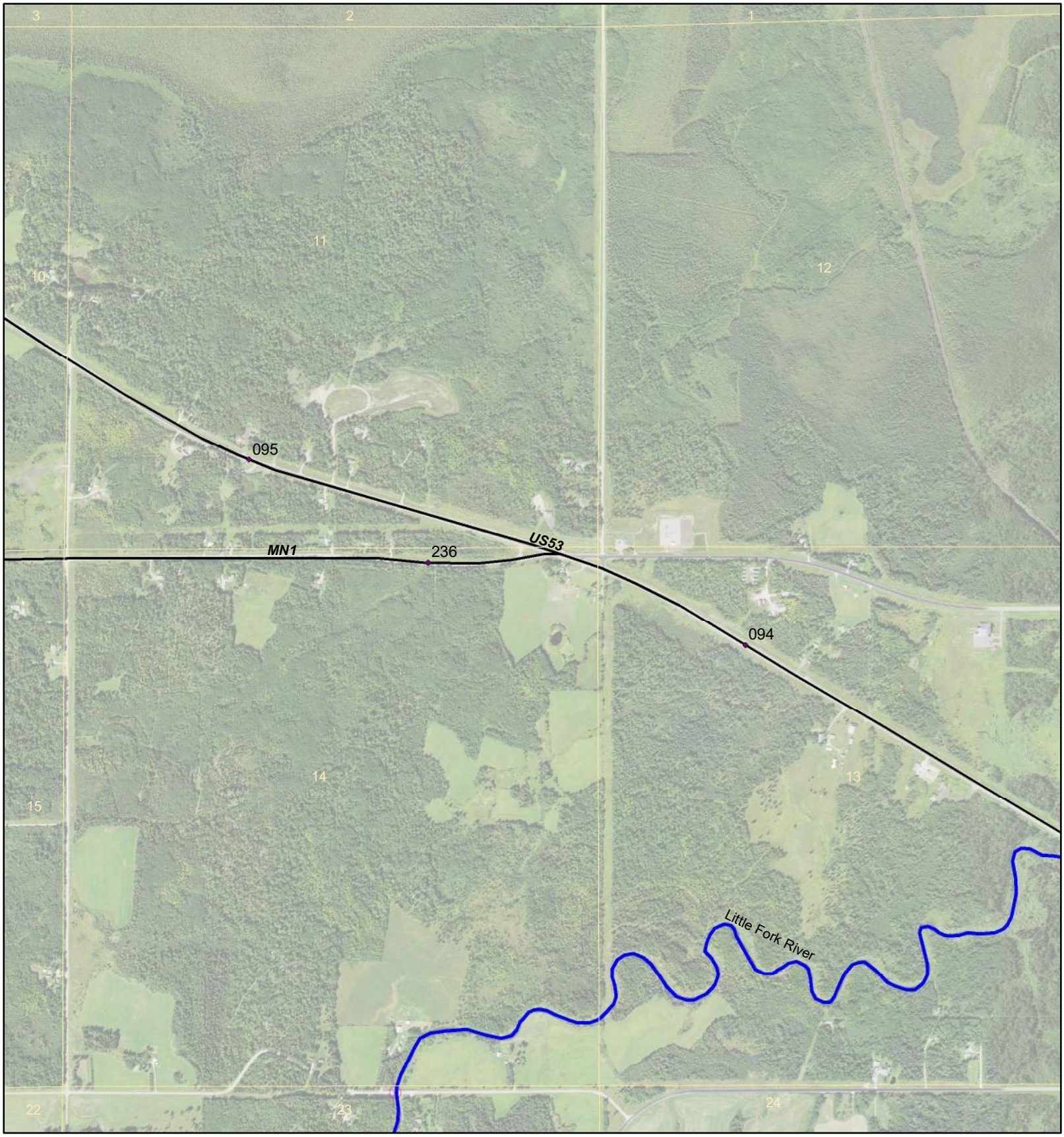
N

TH53 passing lane project (RP136.5 - 139.0) (SP6920-53)

- Public Water Watercourse
- State Forest Land

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 10/23/2018



0 0.25 0.5 1 Miles

N

TH53 - TH1 intersection reconstruction (RP94.0 - 94.4) (SP6920-53)

Public Water Watercourse

mussel survey site

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 11/16/2018

0 0.125 0.25 0.5 Miles

N

TH53 - TH1 intersection reconstruction (RP87.0 - 88.0) (SP6920-53)

Public Water Watercourse

Public Access - Carry-In

Peter Leete, Transportation Hydrologist
(MnDNR-MnDOT Liaison)

Date: 11/16/2018

Protection Measures for Areas of Environmental Sensitivity (AES)

An Area of Environmental Sensitivity (AES) is a generic term to be utilized on plans to identify an area as containing unique characteristics that needs specific protection during construction. These areas may be any area that is identified for added protection due to habitat, wildlife, cultural resources/properties, ecological significance, geological features, visual quality, or its sensitivity to disturbance.

Areas identified on plans as an AES shall not be disturbed during construction. Commonly the actual area to be protected is adjacent to the right of way corridor and the AES identifier is utilized as a buffer. The concern is that soil disturbance, incidental herbicide exposure, hydrologic alterations, tree disturbance, competition from non-native, sod-forming grasses, introduction of weed seeds, or shading by encroaching shrubs can all lead to degradation of these sites.

MnDOT projects must adhere to processes and application of measures consistent with, but limited to, the MnDOT Highway Project Development Process Handbook (HPDP), 2014 Standard Specifications For Construction; Section 2572 (Protection and Restoration of Vegetation), and Section 2101 (Clearing and Grubbing), of which key aspects are listed below:

Examples of an Area of Environmental Sensitivity:
Not all Areas of Environmental Sensitivity (AES) are equal. Many may have stringent levels of regulatory protection on their own, such as Threatened and Endangered Species. However, identifying a site as an AES is to be considered as a generic "stay out of this area" for construction purposes and does not have to reveal the reason for the designation. Typical examples are:

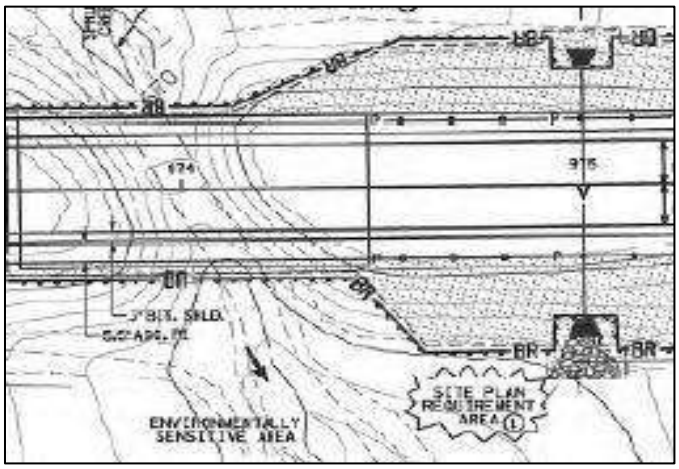
- Wetlands that are not permitted for construction activities.
- Open Water (such as DNR Public Waters, and other perennial streams and waterbodies)
- Trout Lakes and Streams along with their source springs.
- Calcareous Fens. These are identified in 'native plant communities' though due to their unique relationship with groundwater. Impacts to groundwater may also require separate analysis and protection.
- Impaired waters, Special Waters, and/or Outstanding Resource Value Waters (ORVW) as designated by the MPCA. http://pca-gis02.pca.state.mn.us/CSW/index.html.
- Wooded areas with Specimen Trees, or other permanent vegetation designated for preservation.
- Prairie remnants, including but not limited to areas adjacent to Railroad Rights-of-way Prairies.
- 'Sites of Biodiversity Significance' areas designated by the DNR Biological Survey. These sites contain varying levels of native biodiversity such as high quality 'Native Plant Communities', rare plants, rare animals, and/or animal aggregations. http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html.
- 'Native Plant Community' areas designated by the DNR Biological Survey. Native plant communities are classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes. http://www.dnr.state.mn.us/npc/index.html.
- Federal or State listed species, and their habitat.
- Historical sites
- Any natural scenic elements, such as geological features not to be disturbed as designated by project planners, project managers, or project inspectors

Best Practices:
1. Design the project to avoid impacts to identified Area of Environmental Sensitivity.
2. Design and construction should incorporate protection and/or enhancement of adjacent AES features.
3. Label identified Areas of Environmental Sensitivity on all plans.
4. Drainage into Areas of Environmental Sensitivity may also have limitations on impacts.

In situations where work in or adjacent to an AES is authorized:
1. Prior to in-water work in an AES, check to see if a Mussel Survey is required.
2. Protect and preserve vegetation from damage in accordance with MnDOT Spec 2572.3
3. Prohibit vehicle and construction activities, including the location of field offices, storage of equipment and other supplies at least 25 feet outside the dripline of trees or other identified Area of Environmental Sensitivity to be preserved, also in accordance with MnDOT spec 2572.3
4. In areas where there are large or numerous separate of areas to protect, it may be preferred to identify those areas that are OK to be utilized, and have all other areas designated off limits for parking, staging, and/or stockpiling of materials.

5. Walk the perimeter of a sensitive area with the grading foreman so that all personnel understand and agree on the hard edge of the sensitive area.
6. Redundant sediment/erosion control Best Management Practices (BMP's) may be required for protection of areas of environmental sensitivity.
7. Revegetate disturbed soils with native species suitable to the local habitat. Revegetation plans may include woody vegetation (trees and shrubs) in addition to grasses and/or forbs.
8. Coordinate with MnDOT Office of Environmental Stewardship and/or the DNR if an Area of Environmental sensitivity is accidentally disturbed or damaged.
9. Relocate plants if harm is unavoidable (see Information on Transplanting Wildflowers and Other Plants).

For more information:
MnDOT Highway Project Development Process (HPDP): http://www.dot.state.mn.us/planning/hpdp/environment.html
MnDOT 2014 Standard specifications: http://www.dot.state.mn.us/pre-letting/spec/
DNR Sites of Biodiversity Significance: http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html
DNR Rare Species Guide: http://www.dnr.state.mn.us/rsg/index.html



DEPARTMENT OF TRANSPORTATION

Office of Environmental Stewardship
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155-1800

Office Tel: (651) 366-3616

November 16, 2018

Re: S.P. 6920-53 & 6921-24, TH 53 Improvements, Cities of Angora, Fields and Cook, St. Louis and Koochiching Counties

Dear Mr. Alcott,

We have reviewed the above-referenced undertaking pursuant to our FHWA-delegated responsibilities for compliance with Section 306108 (previously known as Section106 of the National Historic Preservation Act [54 USC 300101 et. seq.] and its implementing regulations, 36 CFR 800, and as per the terms of the 2015 Section 106 Programmatic Agreement between the FHWA and the Minnesota State Historic Preservation Office (SHPO). We have also reviewed the above-referenced undertaking pursuant to MnDOT's responsibilities under the Minnesota Historic Sites Act (MS 138.665-.666), the Field Archaeology Act of Minnesota (MS 138.40); and the Private Cemeteries Act (MS 307.08, Subd. 9 and 10).

This project consists of improvements to TH 53 in six different locations between its south junction with TH 1 and R.P. 151.5, north of Ray. The improvements will include intersection revisions at the south junction with TH 1 and the north junction with TH 1. The remaining improvements are passing lanes to be constructed between R.P.s 98.0 and 100.5, 118.5 and 121.0, 136.5 and 139.0, and 149.0 to 151.5. The intersection at the south junction with TH 1 will be redesigned using an R-CUT intersection layout. The majority of the work will take place within the median, with minor changes to the approaches to TH 53. These approaches include TH 1 and County State Aid Highway 122. Intersection lighting, utility relocation, and sight line corrections will be incorporated. The intersection at the north junction with TH 1 will be realigned from an acute skew intersection to an offset tee. It will include intersection lighting and sight line corrections. Each passing lane will consist of a three-lane roadway that will provide a passing opportunity for one direction of traffic at a time. Guardrail will be evaluated and a determination of replacement made as design advances. The project will require permanent right-of-way acquisition at the north junction with TH 1, as shown in the plan provided on September 11. 2018.

Our office consulted with the following tribal groups, as per 36 CFR 800 or existing agreement between FHWA and certain tribes: Bois Forte Band of Chippewa, Fond du Lac Band of Lake Superior Chippewa, Fort Peck Tribes, Grand Portage Band of Lake Superior Chippewa, Santee Sioux Tribe, Turtle Mountain Band of Chippewa, and Upper Sioux Community. None of the tribes responded to our consultation requests. In addition, consultation letters were sent to the Office of the State Archaeologist and the Minnesota Indian Affairs Council, and they did not respond within the allotted time.

The area of potential effects (APE) for direct and indirect effects of the project consists of the proposed construction limits. There are no known archaeological sites in the APE. Much of the APE has been disturbed by previous roadway construction. The APE has low potential for containing unidentified significant archaeological resources. There are no eligible or potentially-eligible buildings or structures in the APE.

The finding of this office is that there will be **no historic properties affected** by the project as currently proposed. If the project scope changes, please provide our office with the revised information and we will conduct an additional review.

Sincerely,

Renée Hutter Barnes

Renée Hutter Barnes, Historian
Cultural Resources Unit
renee.barnes@state.mn.us

cc: Douglas Kerfeld, MnDOT District 1
MnDOT CRU Project File

Appendix F: Noise Study

SBP Associates, Inc.

22502 Beach Road
Deerwood, MN 56444
Phone: 952-920-1500

Trunk Highway 53 Intersection and Passing Lane Improvement Project

Noise Impact Study

December 2018

A. INTRODUCTION

This report presents the noise impact analysis for the proposed Trunk Highway 53 Intersection and Passing Lane Improvement Project extending from approximately 3.5 miles south-southeast of Cook, Minnesota to approximately ten miles southeast of International Falls, Minnesota. The project consists of intersection improvements at the south and north junctions of Trunk Highway (TH) 53 in the vicinity of Cook, as well as four 2.5 mile passing lane segments between Cook and International Falls. One of the passing lane segments is between Cook and Orr, and three are between Orr and International Falls. **Figure 1** depicts the overall project location.

Because of the lane miles added with the passing lane portions of the project, the project is a Type 1 project under MnDOT and FHWA policy. Therefore, a noise impact study is required for all portions of the project, including the intersection improvements.

Improvements at each project location are described under the following headings. Project locations run from south to north in the overall project corridor.

Location 1 – South TH 53/TH 1 Junction
Proposed improvements are depicted in **Figure 2**. Currently, TH 53 is 4-lane divided at this intersection. TH 1 is the east leg of the intersection, and County State Aid Highway (CSAH) 22 is the west leg; both of these are 2-lane highways. To address a high crash rate at this intersection, MnDOT proposes to make Restricted Crossing U Turn (R-CUT) improvements. With this approach, left turns from the minor roadways onto to the mainline (in this case TH 53) are prohibited, as are movements directly crossing the mainline from one minor leg to the other. Instead, drivers make right turns on the mainline and then downstream U turns at newly constructed median crossings to proceed in the desired location on the mainline, or to make a right turn on the opposing minor leg.

Location 2 – North TH 53/TH 1 Junction
Proposed improvements are depicted in **Figure 3**. TH 1 is the west leg of this intersection area, and CSAH 115 is the east leg. All roadways in this area are 2-lane highways. Under current conditions, this intersection can be challenging to drivers to negotiate due to uncommon and unexpected design conditions:

- Severe skew
- TH 1 and CSAH 115 legs are off-set by approximately 175 feet
- Presence of County Road (CR) 937 directly to the east, intersecting both CSAH 115 and TH 53

To improve mobility and safety conditions for drivers through this intersection area, MnDOT proposes to construct off-set T intersections as depicted in **Figure 3**. The intersections will be at 90°, leading to significantly improved sight lines and improved ability for drivers on the minor intersection legs to scan both directions before safely proceeding onto TH 53. Separating the TH 1 and CSAH 115 legs will lead to improved and safer driving conditions as compared with the

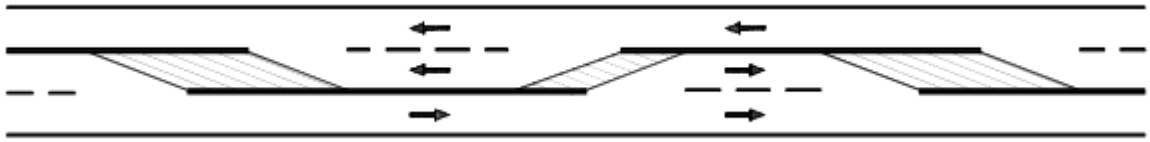
legs being close to each other but not aligned directly. Left turn lanes will also be added to improve operational and safety conditions.

Locations 3-6 – Passing Lane Segments A-D
There is a high percentage of trucks and other slow-moving vehicles, such as vehicles with recreational trailers, in the overall project corridor. Thus, it is important to provide safe passing opportunities for travelers along this stretch of TH 53, which is the key north-south highway in this part of the state.

The passing lane segment locations are depicted in **Figure 1**. Each of these segments are proposed to be 2.5 miles in length. The four individual passing lane locations, respectively, are presented in greater detail in **Figure 4** through **Figure 7**. The existing and proposed typical section for all of the proposed passing lane segments are provided in **Figure 8**. The general approach is summarized below:

- Reconstruct existing paved shoulders to be able to carry through traffic.
- Provide transition areas to move motorists from the current typical section at either end of each passing segment to the proposed passing lane typical section, which will include 4' paved shoulders, 12' driving lanes (one either direction), and one 12' center passing lane (see **Figure 8**).
- Half of each proposed passing lane segment will be dedicated to northbound passing, and half dedicated to southbound passing, with a transition area in the middle.

A general schematic of this approach, known as the "2+1" design, is provided below. It should be noted that this is not to scale and is intended to show the general principal of the design.



Source: Application of European 2+1 Roadway Designs, National Cooperative Highway

B. NOISE AND NOISE DESCRIPTORS

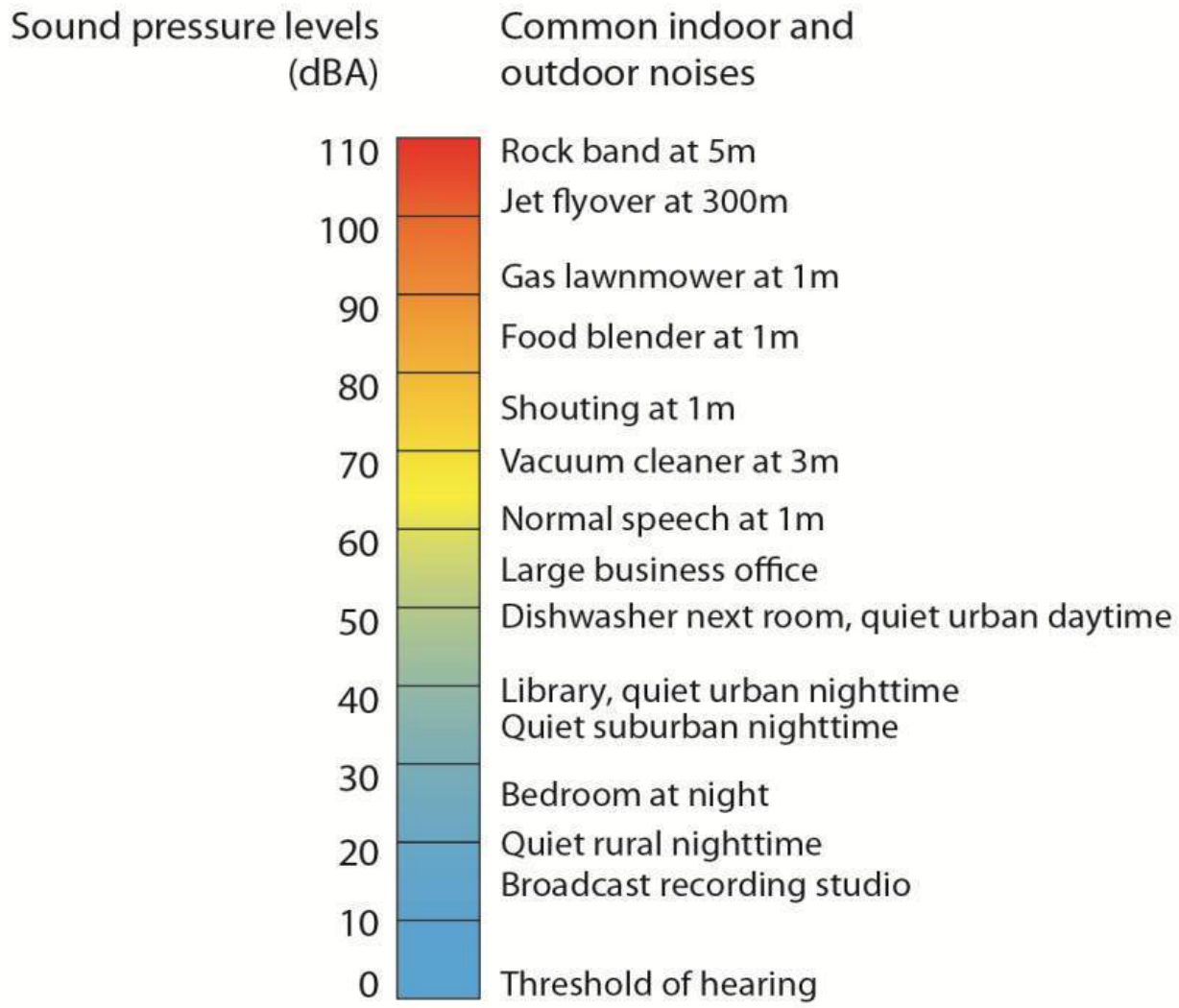
This noise impact assessment is consistent with MnDOT and FHWA requirements and includes results of the monitoring of the existing noise levels as well as the modeling of existing, future no-build, and future build scenario noise levels.

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels (dB) represent the logarithmic measure of sound energy relative to a reference energy level. For highway traffic noise, an adjustment, or weighting, of the high- and low-pitched sounds is made to approximate the way that an average person hears sounds. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA). A sound increase of three dBA is barely perceptible to the human ear, a five dBA increase is clearly noticeable, and a 10 dBA increase is heard as twice as loud. For example, if the sound energy is doubled (e.g. the amount of traffic doubles), there is a three dBA increase in noise, which is just barely noticeable to most people. On the other hand,

if traffic increases to where there is 10 times the sound energy level over a reference level, then there is a 10 dBA increase and it is heard as twice as loud.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels during the loudest traffic hour of the day. This is expressed in terms of the L_{eq} noise level for a one-hour period. The L_{eq} is defined as "the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period." The L_{eq} is compared to FHWA noise abatement criteria.

The following chart (Minnesota Pollution Control Agency, https://www.pca.state.mn.us/air/noise-pollution) provides a rough comparison of the noise levels of some common noise sources.



Source: Minnesota Pollution Control Agency, "A Guide to Noise Control in Minnesota", November 2015.

Along with the volume of traffic and other factors (i.e., topography of the area and vehicle speed) that contribute to the loudness of traffic noise, the distance of a receptor from a sound's source is also an important factor. Sound levels decrease as distance from a source increases. The following rule of thumb regarding how sound decreases with distance is commonly used. Beyond approximately 50 feet, each time the distance between a line source (such as a road) and a receptor is doubled, sound levels decrease by three decibels over hard ground, such as pavement or water, and by four and one half decibels over vegetated areas (soft ground).

C. REGULATORY CONTEXT

Overview

The following rules and regulations govern highway noise impacts for this project:

- A traffic noise impact analysis is required for all Type I Federal-aid projects. Type I projects are defined in 23 CFR 772.5. The proposed project meets the definition of a Type I project because it involves the addition of passing lanes.
- FHWA Noise Standards 23 CFR 772 and 23 CFR 774: includes requirements for traffic noise modeling, noise analysis, noise abatement criteria, and informing local officials.
- Minnesota Statute 116.076 Subd. 2a: lists the following exemptions from the state noise standards: "No standards adopted by any state agency for limiting levels of noise in terms of sound pressure level which may occur in the outdoor environment shall apply to (1) segments of trunk highways constructed with federal interstate substitution money, provided that all reasonably available noise mitigation measures are employed to abate noise, (2) an existing or newly constructed segment of a highway, provided that all reasonably available noise mitigation measures, as approved by the commissioners of the department of transportation and pollution control agency, are employed to abate noise .. and (3) except for the cities of Minneapolis and St. Paul, an existing or newly constructed segment of a road, street, or highway under the jurisdiction of a road authority of a town, statutory or home rule charter city, or county, except for roadways for which full control of access has been acquired."
- In 2016, the Commissioners of the MPCA and MnDOT agreed that the traffic noise regulations and mitigation requirements from the FHWA are sufficient to determine reasonable mitigation measures for highway noise. By this agreement, existing and newly constructed segments of highway projects, under MnDOT's jurisdiction, are statutorily exempt from Minnesota State Noise Standards (MN Rule 7030). As a result, any required noise analysis will follow FHWA criteria and regulations only. Projects will no longer directly address Minnesota Rule 7030.
- Therefore, noise impacts of this project will be addressed using the Federal Noise Abatement Criteria and regulations.

Federal Noise Abatement Criteria (NAC)

In the Federal NAC, for residential and recreational uses (Federal Land Use Categories B and C, respectively), the Federal L_{eq} standard is 67 dBA. For commercial areas (Federal Land Use Category E), the Federal L_{eq} standard is 72 dBA. Locations where noise levels are "approaching" (defined in Minnesota as being within one decibel of the criterion threshold, i.e. 66/71 dBA) or exceeding the criterion level must be evaluated for noise abatement (e.g. noise walls) feasibility and reasonableness. The Federal NAC are shown in **Table 1**.

In addition to the identified noise criteria, the FHWA also defines a noise impact as a "substantial increase" in the future noise levels over existing noise levels. MnDOT considers an increase of five dBA or greater a substantial noise level increase.

Table 1 – Federal Noise Abatement Criteria

Activity Category	Activity Criteria(1,2) Leq(h) dBA	Evaluation Location	Activity Description
A	57	Exterior	Exterior Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B(3)	67	Exterior	Residential
C(3)	67	Exterior	Exterior active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E(3)	72	Exterior	Exterior Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.

Activity Category	Activity Criteria(1,2) Leq(h) dBA	Evaluation Location	Activity Description
F	-----	-----	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	-----	-----	Undeveloped lands that are not permitted
(1) The one-hour Leq shall be used for impact assessment. (2) The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.			

D. PROJECT IMPACT ASSESSMENTS – METHODOLOGY

Existing (2019) and future (2039) build and no-build noise levels were modeled using the FHWA Traffic Noise Model (version 2.5) software. 2019 defines existing conditions in this analysis because this is the year the project is to be constructed. The modeled noise levels for this year are representative of current noise levels.

Traffic noise impacts were assessed by modeling loudest hour 2019 and 2039 build and 2039 no-build noise levels at receptor sites located within the project study areas. Loudest noise hour traffic is based on a modeling analysis of noise levels in order to ascertain the loudest daily hourly traffic flow rate and classification.

In addition to the noise modeling, noise monitoring was also conducted at one site representing a residential receptor for each project location. The monitoring was conducted to confirm existing noise levels and to assist in validating the noise model results. The monitoring sites are shown in **Figures 2** through **7**. It can be seen that the monitoring sites for Location 3 (Passing Lane Segment A) and for Location 5 (Passing Lane Segment C), respectively, are south of the segment termini. The monitoring sites are representative of conditions within the segment.

Noise modeling receptors were selected at commercial and residential sites along the segment corridor. Receptor locations were chosen based on guidance provided in Appendix A of the 2017 MnDOT Noise Requirements. Receptor locations are shown in **Figures 2** through **7**. Residential receptor sites are classified within the definition of Federal Land Use Category B. Commercial receptor sites are classified within the definition of Federal Land Use Categories C and E.

E. HIGH NOISE HOUR EVALUATION

In general, higher traffic speeds, higher traffic volumes, and higher numbers of heavy trucks increase traffic noise impacts. The loudest noise hour typically occurs when traffic is free flowing and heavy truck volumes are at their highest. A modeling analysis was conducted for two or three time periods for each of the six segments to identify the worst case noise hour. The

model results showed that traffic during the noon to 1:00pm hour generated the highest noise impacts for Locations 1 and 2, traffic during the 1:00 pm to 2:00 pm generated the highest noise impacts for project Locations 3 and 4, traffic during the 11:00 am to noon hour generated the highest noise impacts for project Location 5, and traffic during the 9:00 am to 10:00 am hour generated the highest noise impacts for Location 6.

F. NOISE MONITORING

Noise monitoring was conducted at one representative site in each of the six project locations. The noise monitoring sites are shown in **Figures 2** through **7**. Noise levels were monitored at each site twice; during different times of the day. A trained noise monitoring technician was present at each session for the entire monitoring session to ensure correct operation of the sound level meter (SLM). The monitoring results were compared with modeling results for traffic conditions encountered during the monitoring. **Table 2**, below, presents the results of this comparison.

Table 2 – Noise Monitoring Results Compared to Modeling Results

Project Location Number	Site ID	Date	Time	Monitored L_{eq} Noise Level (dBA)	Modeled L_{eq} Noise Level (dBA)	Difference Between Monitored and Modeled L_{eq} Noise Level (dBA)
1	M1	10/29/2018	10:38 am to 11:08 am	57.0	56.8	-0.2
		10/29/2018	1:05 pm to 1:35 pm	57.4	56.8	-0.6
2	M2	10/30/2018	11:30 am to 12:00 pm	61.0	58.3	-2.7
		10/30/2018	12:06 pm to 12:36 pm	62.8	60.8	-2.0
3	M3	10/29/2018	3:20 pm to 3:50 pm	49.2	51.0	1.8
		10/23/2018	8:42 am to 9:12 am	51.7	49.3	-2.4

4	M4	10/23/2018	2:35 pm - 3:05 pm	58.1	55.4	-2.7
		10/23/2018	11:08 am - 11:38 am	56.2	54.0	-2.2
5	M5	10/29/2018	5:05 pm to 5:35 pm	53.6	52.1	-1.5
		10/30/2018	9:05 am to 9:35 am	53.5	50.1	-3.4
6	M6	10/23/2018	4:16 pm to 4:36 pm	53.0	48.7	-4.3
		10/23/2018	1:17 pm to 1:37 pm	51.6	51.1	-0.5

Generally, the L_{eq} monitored noise levels show good agreement (within about 3 dBA) with the modeling results. The exceptions were one of the two measurements conducted for Location 5, and one of the two measurements conducted for Location 6. The measurement for Location 5 is near a retail facility. Noise from activities at the retail facility were noted and may have contributed to the higher measured levels at this location. For the measurement at Location 6, wind gusts were noted during the monitoring period, causing rustling of nearby high grass and leaves, likely contributing to the higher measured noise level.

G. NOISE IMPACTS ASSESSMENT

Existing (2019) and 2039 no-build and build noise impacts were modeled at receptor locations along each of the six project locations. The results of this analysis are provided in **Table 3**, next page. Following the summary table is a discussion of the modeling results for each of the project locations.

Table 3 – Noise Impact Assessment Modeling Results

Project Location Number	Receptor ID	Modeled Existing	Modeled 2039 No Build	Difference Existing to 2039 No Build	Modeled 2039 Build (1)	Difference Existing to 2039 Build (2)
		Leq	Leq	Leq	Leq	Leq
1	R1-01	56.8	57.2	0.4	57.9	1.1
2	R2-01	52.9	53.3	0.4	54.1	1.2
	R2-02	57.7	58.1	0.4	58.6	0.9
	R2-03	53.8	54.1	0.3	56.1	2.3
	R2-04	47.8	48.2	0.4	49.2	1.4
3	R3-01	51.1	51.5	0.4	53.2	2.1
	R3-02	48.4	48.9	0.5	49.8	1.4
	R3-03	51	51.5	0.5	53.4	2.4
4	R4-01	38.7	39.1	0.4	40.2	1.5
	R4-02	55.8	56.2	0.4	58.2	2.4
5	R5-01	37.0	37.5	0.5	40.2	3.2
	R5-02	54.2	54.6	0.4	57.1	2.9
	R5-03	56.4	56.9	0.5	58.8	2.4
	R5-04	58.0	58.4	0.4	59.9	1.9
6	R6-01	47.9	48.4	0.5	50.1	2.2
	R6-02	51.2	51.7	0.5	53.5	2.3
	R6-03	56.8	57.3	0.5	59	2.2
	R6-04	51.6	52.1	0.5	54.6	3
	R6-05	50.7	51.2	0.5	52.9	2.2
	R6-06	49	49.5	0.5	50.9	1.9
	R6-07	49.8	50.3	0.5	51.9	2.1
	R6-08	49.0	49.5	0.5	50.9	1.9

(1) No modeled receptor location approached (66 dBA or greater) the Federal Noise Abatement Criteria.
(2) Predicted noise level increases are less than 5 dBA at all receptor locations.

Location 1
*Receptor R1-01 (**Figure 2**)*
The one receptor in the vicinity of the construction for this segment is an industrial plant that includes a building with offices. The 2039 modeled build noise levels do not approach the Federal Noise Abatement Criteria at this location. Under the 2039 build scenario, the modeled peak-hour L_{eq} noise level is 57.9 dBA. This is 0.4 dBA higher than the modeled 2039 No-build scenario, and 1.1 dBA higher than the existing 2019 modeled noise level.

Location 2
*Receptors R2-01, R2-02, R2-03, and R2-04 (**Figure 3**)*
Receptor R2-02 is a commercial business, and the others are residences. The 2039 modeled future build noise levels do not approach the Federal Noise Abatement Criteria at any of the

modeled receptor locations. Under the 2039 build scenario, modeled peak-hour L_{eq} noise levels at the four modeled receptor locations range from 49.2 dBA to 58.6 dBA.

Under the build scenario, modeled peak-hour 2039 L_{eq} noise levels exceed existing noise levels by 0.9 dBA to 2.3 dBA.

Location 3
*Receptors R3-01, R3-02, and R3-03 (**Figure 4**)*
These receptors each represent residences. The 2039 modeled build noise levels do not approach the Federal Noise Abatement Criteria at any of the modeled receptor locations. Under the 2039 build scenario, modeled peak-hour L_{eq} noise levels at the 3 modeled receptor locations range from 49.8 dBA to 53.4 dBA.

Under the build scenario, modeled peak-hour 2039 L_{eq} noise levels exceed existing noise levels by 1.4 dBA to 2.4 dBA.

Location 4
*Receptors R4-01 and R4-02 (**Figure 5**)*
Both receptors represent residential locations. The 2039 modeled build noise levels do not approach the Federal Noise Abatement Criteria at either of the modeled receptor locations. Under the 2039 build scenario, modeled peak-hour L_{eq} noise levels at the two modeled receptor locations range from 40.2 dBA to 58.2 dBA.

Under the build scenario, modeled peak-hour 2039 L_{eq} noise levels exceed existing noise levels by 1.5 dBA to 2.4 dBA.

Location 5
*Receptors R5-01, R5-02, R5-03, and R5-04 (**Figure 6**)*
The receptors all represent residential locations. The 2039 modeled future build noise levels do not approach the Federal Noise Abatement Criteria at any of the modeled receptor locations. Under the 2039 future build scenario, modeled peak-hour L_{eq} noise levels at the four modeled receptor locations range from 40.2 dBA to 59.9 dBA.

Under the build scenario, modeled peak-hour 2039 L_{eq} noise levels exceed existing noise levels by 1.9 dBA to 3.2 dBA.

Location 6
*Receptors R6-01, R6-02, R6-03, R6-04, R6-05, R6-06, R6-07, and R6-08 (**Figure 7**)*
The receptors all represent residential locations. The 2039 modeled future build noise levels do not approach the Federal Noise Abatement Criteria at any of the modeled receptor locations. Under the 2039 future build scenario, modeled peak-hour L_{eq} noise levels at the four modeled receptor locations range from 50.1 dBA to 54.6 dBA.

Under the build scenario, modeled peak-hour 2039 L_{eq} noise levels exceed existing noise levels by 1.9 dBA to 3.0 dBA.

H. CONSTRUCTION NOISE

During construction, it is unavoidable that noise levels will increase in the immediate area surrounding the project site. The actual noise levels on and adjacent to the site will vary considerably depending on the numbers and types of equipment being operated at any given time. **Table 4**, below, shows peak noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, which is generally the roadway construction phase associated with the greatest noise levels.

Table 4: Typical Construction Equipment Noise Levels at 50 Feet

Equipment	Manufacturers Sampled	Total No. of Models in Sample	Peak Noise Level (dBA)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/S	N/A	95-105	101

Source: US Environmental Protection Agency and Federal Highway Administration

Construction activities will be temporary in duration. The contractor will be required to comply with applicable local ordinance requirements regarding noise. Construction equipment will be required to have factory installed mufflers or their equivalents in good working order during the life of the construction contracts. While it is possible that limited night construction may be required for this project, it is anticipated that construction activities will take place during the less noise-sensitive daylight hours. Pile driving will not be required for this project. Jack-hammering and concrete sawing will not take place during the nighttime hours. The loudest construction activities will only take place on a given portion or portions of the corridor at one time. The total duration of the project will be one construction season.

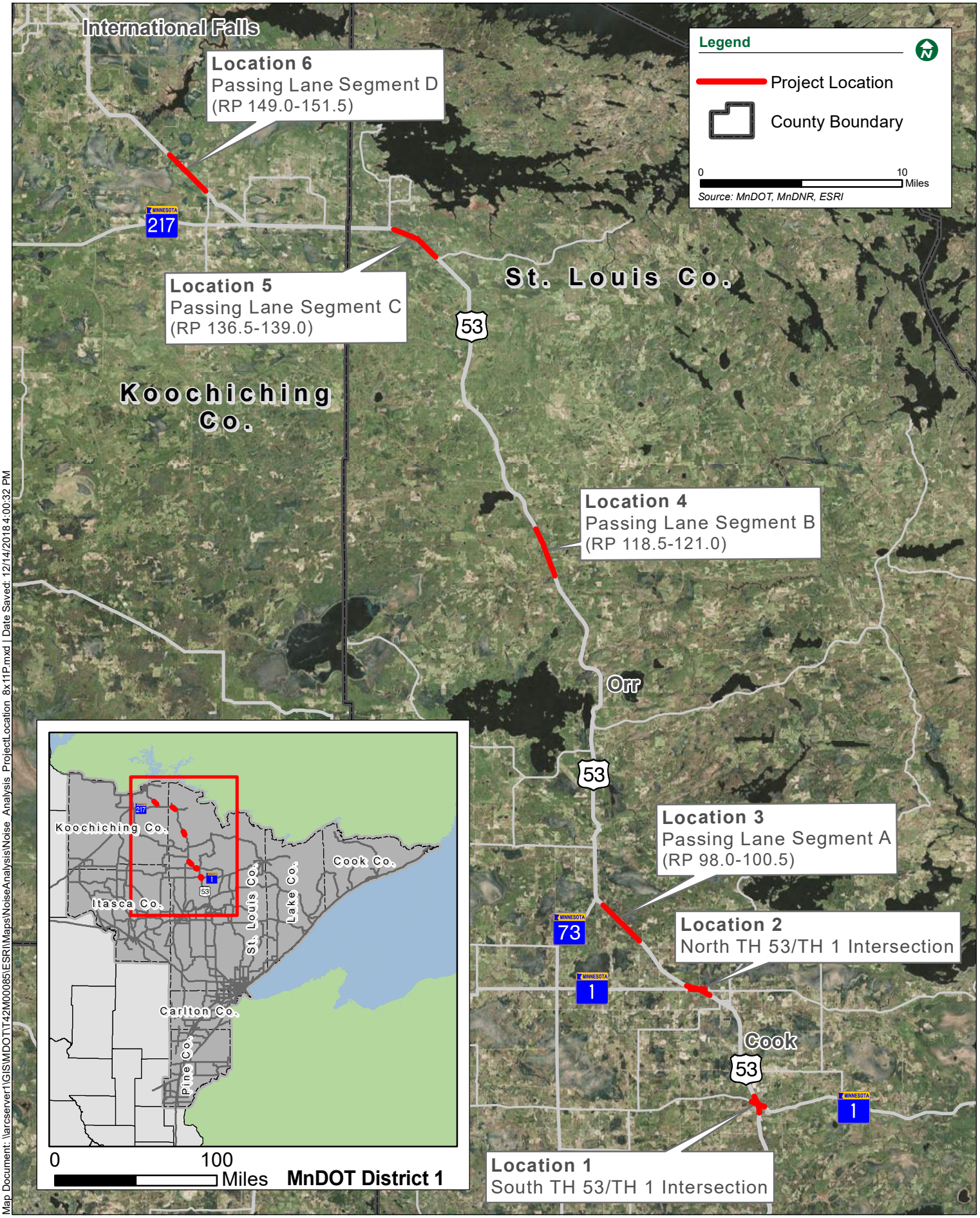
I. CONCLUSION

Modeled existing (2019), 2039 build, and 2039 no-build modeled noise levels do not approach the Federal Noise Abatement Criteria. Additionally, modeled noise level increases over existing noise levels are less than 5 dBA at all modeled receptor locations. Therefore, no noise mitigation measures are proposed for this project.

Construction noise will be typical for roadway construction projects of this nature and special or unique mitigation measures will not be required.

Figures

Figure 1: Project Location



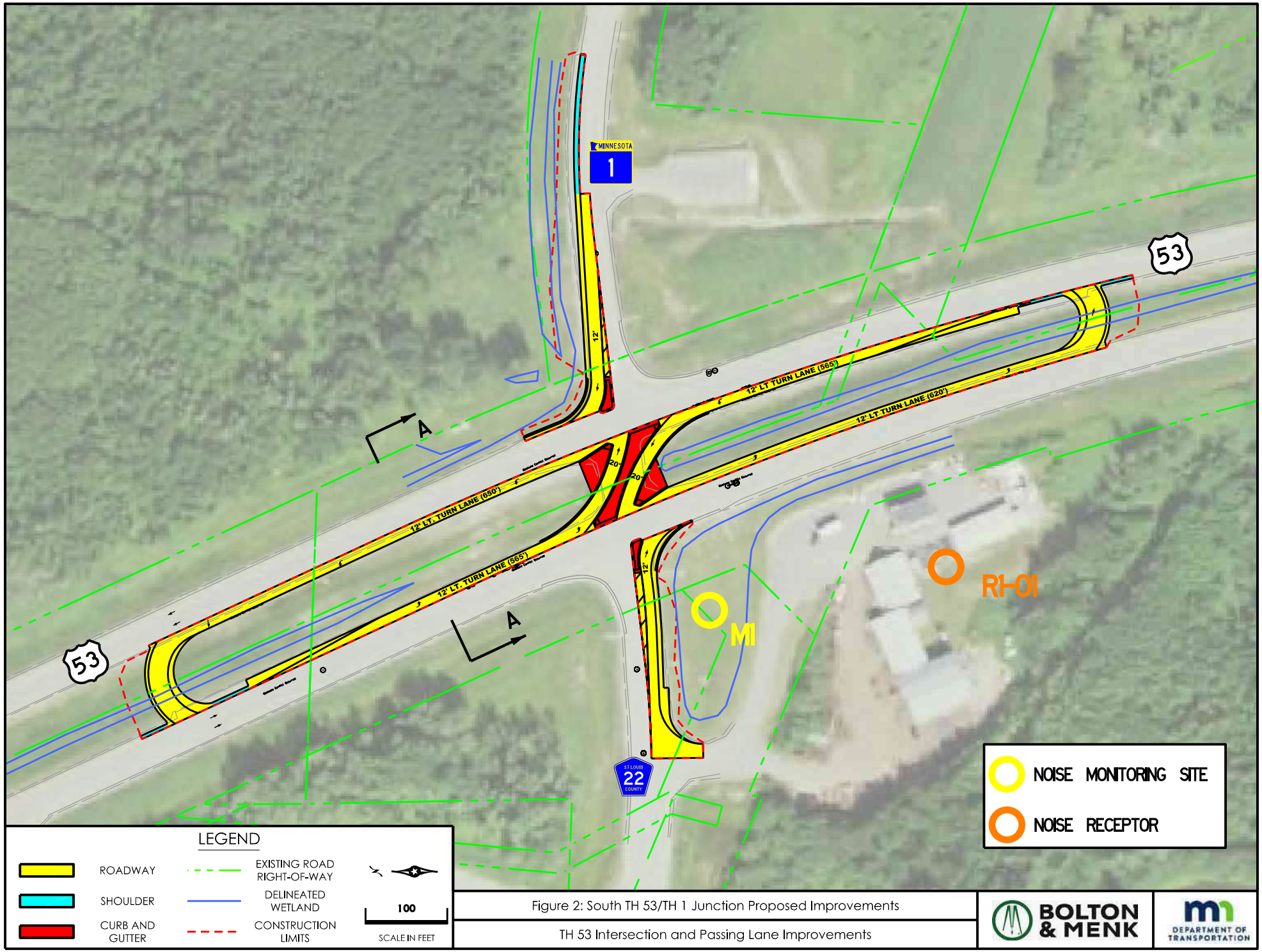


Figure 2: South TH 53/TH 1 Junction Proposed Improvements

TH 53 Intersection and Passing Lane Improvements

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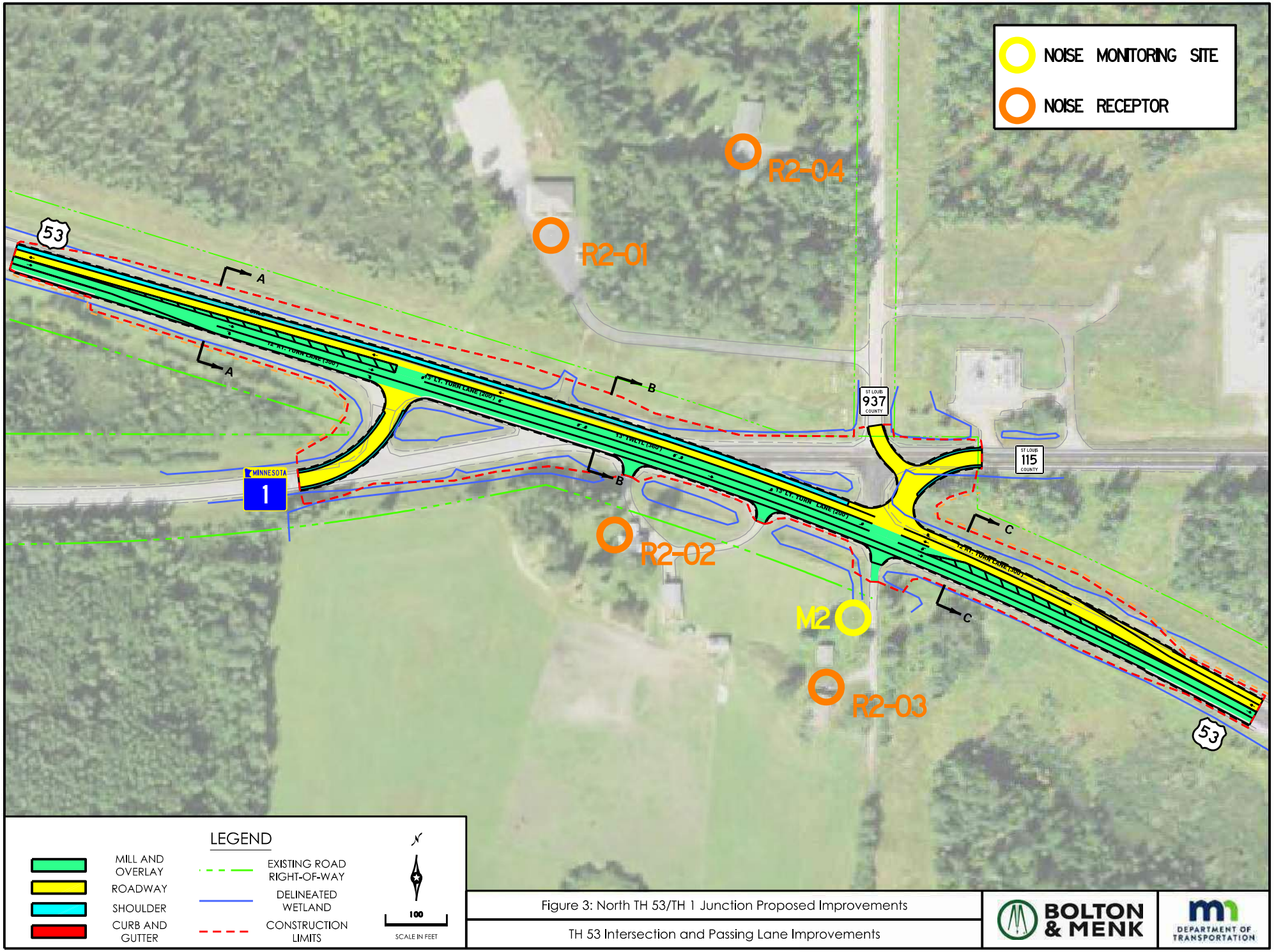

Figure 3: North TH 53/TH 1 Junction Proposed Improvements

TH 53 Intersection and Passing Lane Improvements

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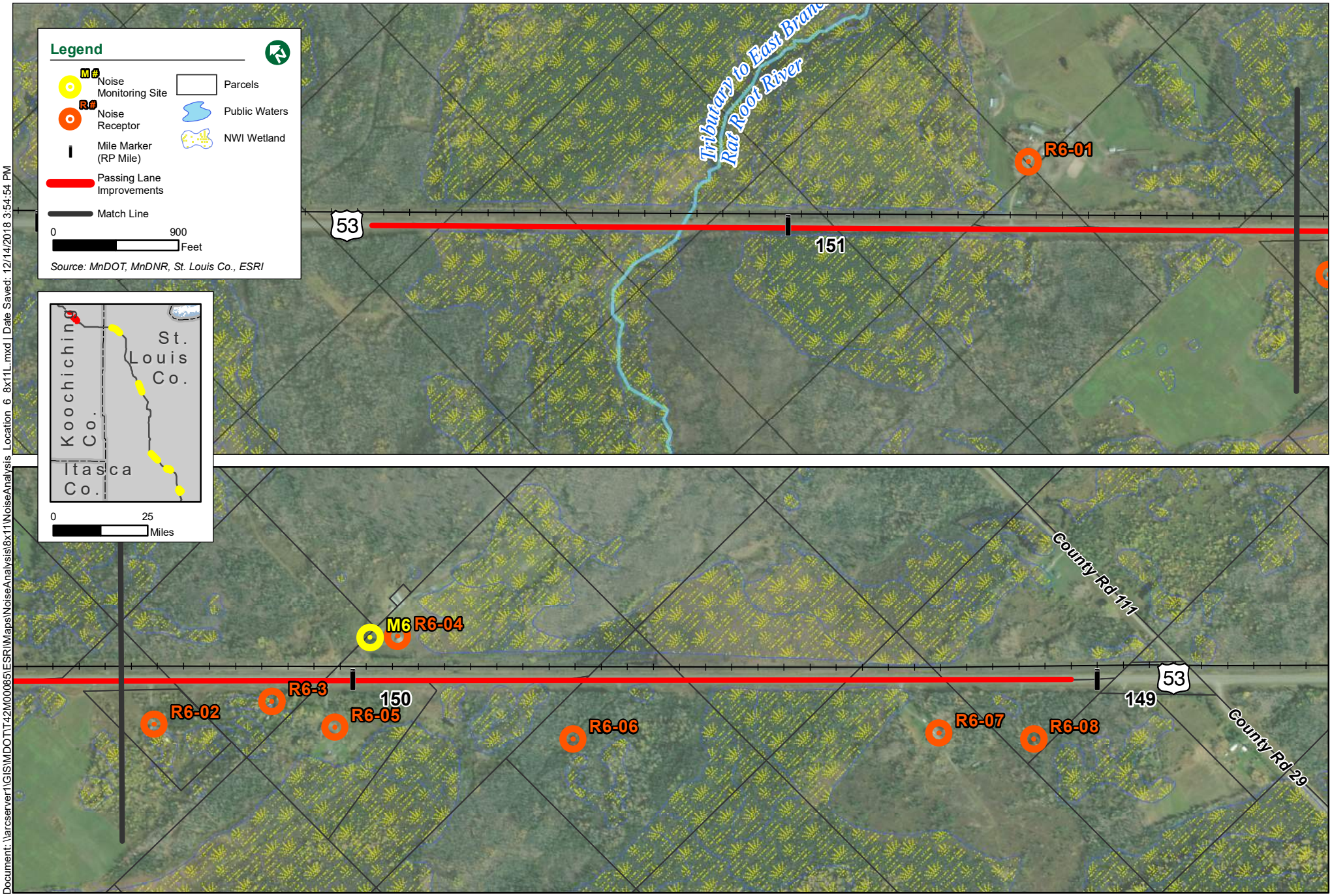

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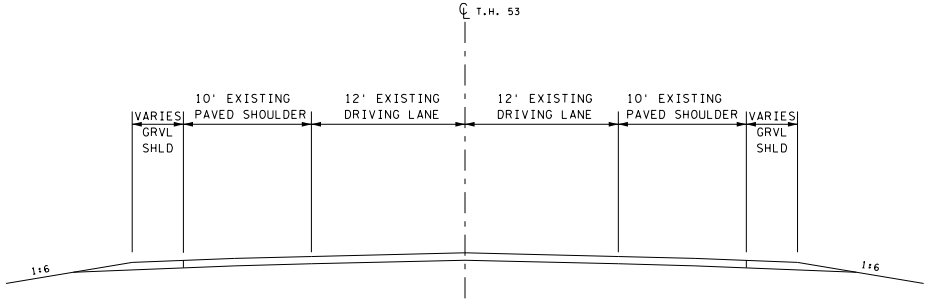
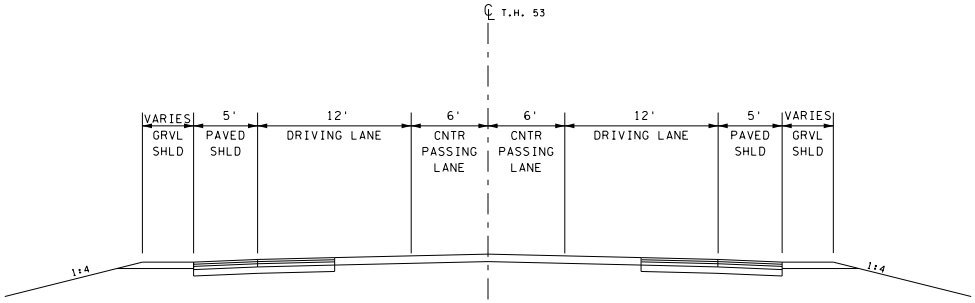
LOCATIONS 3-6
EXISTING TYPICAL SECTION - T.H. 53

R.P. 98+00.000 - 100+00.500
R.P. 118+00.500 - 121+00.000
R.P. 136+00.500 - 139+00.000
R.P. 149+00.000 - 151+00.500



LOCATIONS 3-6
PROPOSED TYPICAL SECTION - T.H. 53

R.P. 98+00.000 - 100+00.500
R.P. 118+00.500 - 121+00.000
R.P. 136+00.500 - 139+00.000
R.P. 149+00.000 - 151+00.500



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REV.	BY	DATE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

ENGINEER SIGNATURE 1

ENGINEER
LIC. NO. 12345 DATE XX-XX-XXXX

DESIGNED	XXX
DRAWN	XXX
CHECKED	XXX

S.P. 6920-53
TH 53 ALTERNATE INTERSECTIONS AND PASSING LANES
SHEET NAME

SHEET X OF XX

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